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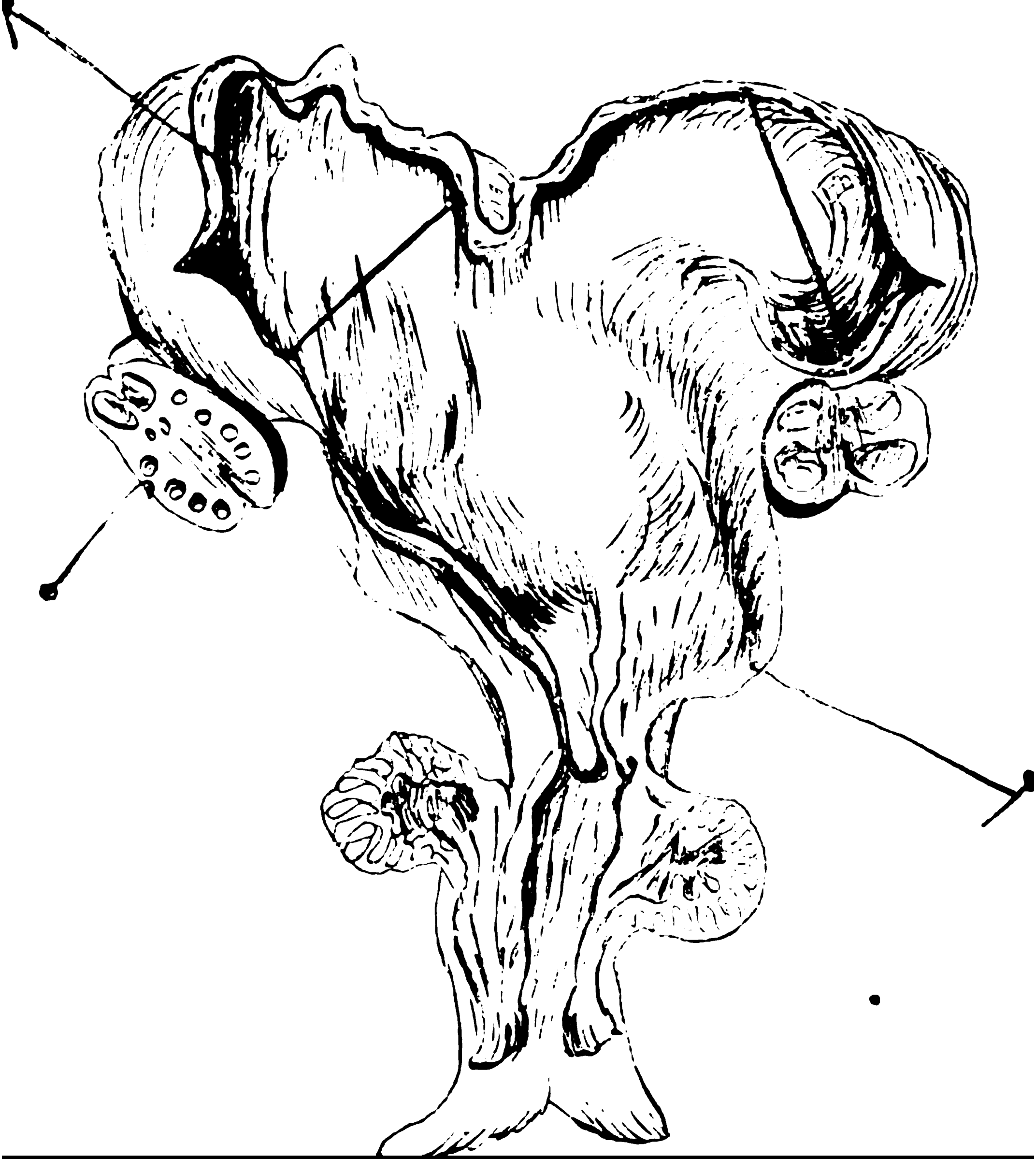

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ART. I.—RECENT CONTRIBUTIONS TO THE LITERATURE OF COMPARATIVE MEDICINE.

PART II.

THE CYSTICERCUS CELLULOSÆ OR MEASLES DISEASE OF ANIMALS AND MEN.

THIS disease has been recognized from very early times; indeed, it is said that Aristophanes described it in the hog, and Aristotle was also aware of it. Our present knowledge of the way in which it effects an entrance into the body, and its life history, are due largely to the investigations of Küchenmeister, Haubner, Heller, and some others. This cysticercus, according to the latter authority, is the larval or immature form of the common tape-worm—the taenia solium, that is said to occur only in the small intestine of man. The cyst which lodges the parasite is seldom larger than a bean, and contains a clear fluid. The little body, of a white or yellowish color, is enclosed in a pyriform sac, and depends from the wall of the vesicle. The head is surmounted by four suckers and a double row of hooks, each one of which rests in a little pouch-like depression. Occasionally the cysticerci are found free, that is, they have no capsule—as in the ventricles of the brain. In such instances, they are more or less clustered together and united by connective tissue filaments with the floors of the ventricles, or trunks of nerves and vessels. When the embryonic cysticercus first locates himself in the tissue, he has only six hooks; these are soon thrown off, and then the gradual development of the permanent larval form begins. This phase of life history is completed in about two-and-a-half months, while the total duration of life varies from three to six years. The final condition is often that of a little calcified mass, in which the hooklets may be artificially dissolved out by any solvent of lime salts, such as muriatic acid. At such an advanced period it is plain that there is no danger of infection. The measle is said to have been found in the ape, the bear, dog, rat, and deer. It may occur in any part of the body, but is chiefly lodged in the intermuscular connective tissue. The symptoms will often be insignificant, and yet when the brain or eye is involved, they may be very violent. After the larval process is entirely completed, the morbid manifestations usually abate.

It is difficult to make a diagnosis of the disease, except when it is accessible to the knife, as in the skin, or may be detected by the opthalmoscope. Successful treatment, therefore, is only possible in a limited number of instances. But even acting on the supposition that the system at large is positively known to be infected, we are not possessed of any remedy that will destroy the parasites without doing a probable harm to the unhappy bearer. Prophylaxis, accordingly, is the object to which attention should be mainly given. Individuals may be diseased in two ways:

1. By self-infection. A person having a tape-worm may regurgitate a mature joint or segment into his stomach. The digestive juices dissolve the joint, and the six-hooked embryo is ready to start out on his journey, which he does very often by directing his path towards the liver. The precise avenues he takes, whether the blood-paths or lymphatics, is unknown. He may possibly pierce directly through the tissues.

2. The mature eggs from another person, after expulsion from the bowel, may in some way gain access to the body, possibly with the drink. Hogs are remotely the cause, because they lodge the measles, which, when swallowed by the human subject, under the form of raw or under-done pork, or even smoked or pickled meat, will produce the tape-worm, and this, in turn, the measles in man, as first described. Eradication of the disease from swine is therefore a matter of the very first importance, and should occupy the attention of all our public sanitary boards.

The following recent case is given by Heller, as contributed by Dr. G. Merkel. A working girl, twenty-three years old, of previous good health, began to complain of headache. After a violent attack, where maniacal symptoms were developed, she was ordered to the hospital, but died on the way. The post-mortem examination revealed extreme anæmia of the brain, with a slight degree of chronic internal hydrocephalus; on the corpora quadragemina there was a tumor, the size of a small hazel nut, loosely united to the membranes. It consisted of five or six very delicate, transparent little cysts, the diameters of small peas, and clustered together like grapes, each with a terminal vesicle the size of half a bean. One of the little cysts exhibited a minute white point in the centre, the size of a pin-head. Under the microscope it was seen to be the head of a cysticercus, with twenty-nine adherent hooklets and two loose ones.

The same author also mentions an instance in which a post-mortem examination revealed an infiltrated spot in the lung; in the centre was a cavity, the size of a barley-corn, distended with a transparent vesicle, which proved to be a cysticercus, in which there was a rudimentary development of the head. No other larvæ were found in the body.

In view of the fact that the disease is communicated to swine through human excrement, and that the hog returns the disease in the altered form of the tape-worm to the original donor, it is plain that two things are necessary, from a prophylactic point of view. Pork should be carefully inspected with a view to rejecting all "measly" meat, and hogs should never be allowed any possible access to human ordure, which is a matter of everyday occurrence in our towns and villages. Severe penalties should attach to the neglect of this latter important sanitary regulation.

It is interesting to note that numerous larvæ may be present, and yet not produce symptoms of any sort. Most frequently, however, they give rise to slight or more severe symptoms; indeed, under certain circumstances a single one is capable of producing death.

The cysticerci at times undergo contractions, and it is thought possible that marked cerebral phenomena may be due to this peculiar movement which belongs to them. Hitzig managed to induce real epileptic attacks in animals (dogs), by introducing particles of degenerate material into the cortical portion of the brain. He inferred that the action of the cysticerci might be similar in kind.

Dr. C. S. Turnbull, of Philadelphia, discovered one of these parasites in the eye of a patient, and has given the following history of the case: A patient (aet. 55) was attacked with pain in an eye that had been the seat of cataract for about fifteen years. The pains increased in intensity, and were paroxysmal, the feeling being described as if there were "strokes of a hammer inside of the eye." There was also vascular engorgement and profuse lachrymation. On opthalmoscopic examination, a sac was seen in the posterior chamber. It was united to the ciliary margin. The next day the diagnosis was assured, from the fact that the parasite was seen detaching itself. On the third day he was floating free in the aqueous humor. The appearance of the cystitercus was astonishingly like a balloon, of which the sac was the gas receptacle, and the head the basket. In moving about, he withdrew himself, from time to time, into the balloon, and then suddenly threw himself out. He was removed on the ninth day by Graefe's operation for cataract.

The following case has already been alluded to as an example of the possible difficulties attending diagnosis in a case of hydrophobia: A woman, aged fifty-two, was bitten in the face by a dog. All efforts at swallowing were attended with severe and painful spasms. A white, sticky saliva flowed from her mouth; blowing upon the face also produced reflex spasms. This case, which was diagnosticated as canine rabies, was regarded by Mr. Dolan, who reports it, as due to cysticerci, for at the post-mortem examination there was found at the base of the brain a pyriform cyst, the size of a large nut, " which penetrated into the fissure of Silvius." The tumor was filled with cysticerci.

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THE ECCHINOCOCCUS OR "HYDATID" DISEASE.

The ecchinococcus is now generally known to be the larval or immature form of the tænia ecchinococcus, a small cestode or tape-worm that infests the dog. Its length is only about one-eighth of an inch, and it is usually lodged in the upper part of the small intestine. It differs chiefly from the ordinary tape-worm in its smaller size and the limited number of joints, of which there are only three, exclusive of the head. The latter is surmounted by two rows of blunted hooklets, fifteen to twenty-five in each row. This parasite attacks man, the domestic animals such as the horse, cow, sheep, goat, or hog, and some wild animals; and has even been seen in the turkey (Von Siebold). When the human being has been selected as the site for the larval form—the ecchinococcus—we find a sac of varying size, which contains the little animal. So small may this object be, that it is barely recognized by the unaided eye; or, on the other hand, so large that it forms a very considerable tumor, altering the form of the body, and clearly appreciable by palpation. On the inner surface of the cyst are numbers of little elevations, which enclose small capsules—the so-called brood-capsules—from the walls of which the tape-worm heads depend. Being endowed with a capacity for active movement, the little animals elongate or contract upon their pedicles, and so immerse themselves at will in the fluid of the general cyst.

Each head is covered with four discs or suckers in addition to the hooks. Sometimes these ecchinococci become separated from their base and float about at large. Since the parasite in this condition has a very feeble power of locomotion, it is difficult to believe that it forces its way through the tissues in reaching its usual haunt, the human liver. Authorities regard it as most probable that the avenues of entrance are either the bile ducts or portal vein and its tributaries. We should not forget that Küchenmeister has intimated that man may also harbor the mature form of the parasite, *i. e.*, the tænia ecchinococcus and the development of the sacs is then to be explained by self-infection. This view has received some recent confirmation.

The word "hydatids" has sometimes been applied to this disease, but it is likely to cause confusion, because it is associated often with an altogether different affection, viz., uterine hydatids, a cystic metamorphosis of the chorion, which does not even bear an external resemblance to the ecchinococcal disease produced by the parasite. Genuine instances of the latter are rarely found in the uterus proper, though it is not uncommon to find them in the sub-peritoneal tissue. Graily Hewitt suggests, with some propriety, that if the uterine wall is really involved, the lesion may be secondary, as indeed it is not uncommon for the liver tumor to soften, discharge into the peritoneum, and finally be expelled from the body through some suppurating tract, just like any foreign body in a similar situation. In fine, uterine " hydatids" are little pellucid sacs caused by a cystic change in the villosities of the chorion; ecchinoccocal " hydatids" are multilocular sacs of considerable firmness, which either communicate with the general cyst cavity, or are enclosed within one another, and are caused by the presence of animal parasites.

The word "acephalocyst" has been applied to the sacs where no heads could be found, but it is now thought best to abandon it, because the absence of a head does not denote the absence of the animal, but rather its infrequency, sparseness, or imperfect development, as in a case mentioned by Heller, in which there were numberless sacs in the liver and lungs of a cow, and yet very few scolices or heads. Every organ of the body may be affected, but the liver is the chief haunt.

The so-called multilocular ecchinococcus is now regarded as a peculiar form of the same disease. When found in the human liver—its usual seat—there is a hard mass which supplants the liver tissue proper, and in some places increases so as to become a tumor of gigantic size. It consists of a fibrous tissue of very firm texture, interspersed with a network of intercommunicating spaces, which, from their arrangement, were supposed by Virchow to indicate that the lymphatics were the original seat of the lesion. Friedreich, on the other hand, has intimated that the blood-vessels or gall-ducts are first attacked.

Neither scolices nor hooklets are found with any regularity, and the tissue is prone to break down and form an abscess.

Thus far, according to Heller, we have had reports of the multilocular ecchinococcus in only thirty-nine cases (cattle four, man thirty-five.) Of these, twenty-seven have been more or less accurately observed. Fourteen occurred in Switzerland, eight in Bavaria (the southern part, mostly), seven in Wurtemberg, three in Austria, one each in Baden and Dorpat, and one in an unknown part of the country.

The least age of the human cases was nineteen; the greatest, sixty-eight. In twenty-one of the cases either scolices or hooklets were found; in eight they were not found.

In the human species the supra-renal capsule was involved but once; the liver twenty-five times. Four times the multilocular ecchinococcus was found in the lungs. The parasites were usually not confined to their first seat, but were scattered over other parts of the liver, including the lobulus spigelii, lobus quadratus, the portal lymphatic glands, and the peritoneum. Perforations of the vena porta, hepatic veins, and biliary passages occurred.

The subjoined table, by Finsen, gives a record of 255 cases that were observed in Iceland, where the disease is very rife, owing to the very great numbers of dogs. With each organ is given the number of times it was involved: Liver, 176; kidney, 3; spleen, 2; peritoneal cavity (original site uncertain), 54; lungs, 7; head, 4; mamma, 1; other portions of the surface of the body, 8.

Of thirty-four cases, with doubtful primary lesion, the liver was certainly affected in the majority. Of 189 cases, fifteen were in children under ten years of age; thirty-five between ten and twenty; forty-nine between twenty and thirty; twenty-three between thirty and forty; twenty-seven between forty and fifty; twenty-one between fifty and sixty; fourteen from sixty to over eighty; five uncertain. The youngest case was four years old; the oldest, eighty-seven.

It is said that in some of Finsen's patients, the disease had exhibited itself at the early age of two years. Among the more recent cases is one of sudden paralysis, reported by Liouville and Strauss (*Progres. Med., 1875, No. 4*). The cause was found to be compression of the medulla by an ecchinococcus, which had effected an entrance into the spinal canal from without, at the level of the tenth spinal vertebra.

The symptoms in the human species exhibit many variations, which need particular description. The following summary is given by Heller: At first there are gastric disturbances, with occasional pains in the epigastrium, or right hypochondrium; later, a sense of fullness and weight in the belly; as a rule, jaundice appears early; at first it is slight, but soon increases, and is apt to reach great intensity. Digestion is generally disturbed at an early period; constipation alternates with diarrhœa; the passages usually have a clay color, though they sometimes appear normal. Soon the patient observes that there is a distinct swelling of the belly, increasing gradually and almost imperceptibly. Examination reveals a decided and often very considerable enlargement of the liver; it is of varying consistence, though the surface is smooth. When the affected portions are accessible to the touch, they appear firm and even, or irregularly tuberculated; sometimes, though seldom, hard nodules are to be felt. The spleen is almost always considerably enlarged, and sometimes not easily demarcated from the liver. No important disturbances are to be observed in the respiratory organs and nervous system. Pain in the liver is sometimes constantly present, sometimes periodically increased. Occasionally it is absent and is only to be detected by pressure. Frequently there is a tendency to hæmorrhages; in the last stages there are dropsical swellings. Fever does not usually ensue until the end of life approaches, and is often superinduced by other accessory inflammatory processes. Death is usually the result of exhaustion, but sometimes is caused by other complications, such as cerebral hæmorrhage, pericarditis or peritonitis.

The diagnosis is very difficult during lifetime, since the symptoms, as may be gathered from the preceding statements, offer nothing distinctive of this disease. In making a diagnosis, the ordinary ecchinococcus affection and cancer of the liver are to be differentiated. In the former the enlargement of the spleen is, as a rule, absent, while in the multilocular form it is almost always present; in the former jaundice is very rare, in the latter almost the rule; fluctuation in the latter is only exceptional, and an exploratory puncture would make the distinction, since the simple form would yield a fluid of the material that has previously been described, while the contents of the gangrenous cavity, which forms in the multilocular variety, is always more or less stained with bile. In distinguishing this affection from cancer of the liver, the course of the disease is to be specially noted. Cancer of the liver always has a more speedy course, while the ecchinococcus has a long continuance. Cancer of the liver that has progressed some weeks exhibits alterations in form and size; the general disturbances of nutrition are also far less frequent; so, too, there is seldom enlargement of the spleen; on the contrary, this is usually small and atrophic; it is only in cases that run a very acute course that they are swollen; in these the ecchinococcus disease is excluded on account of the rapid course. In cancer of the liver there is always a possibility of feeling the cancerous nodules by the projection of the liver below the free borders of the ribs. Abscess of the liver, waxy liver, and hepatic syphilis are not difficult of diagnosis; and it may also be said that the rarer hypertrophic form of cirrhosis of the liver may be excluded without much difficulty. It is very questionable whether an examination of the intestinal discharges, with reference to fragments of the ecchinococcus, will establish a diagnosis.

The prognosis is utterly unsatisfactory. All the cases that have thus far been known have terminated fatally. Treatment, except in the cases of Griesinger and Jürgensen, has been purely symptomatic, since it is absolutely hopeless. Prougeansky wisely recommends operative procedures, with the faint hope that a cure may be reached in this way.

THOMAS E. SATTERTHWAITE, M. D.

The thirty-five cases spoken of by Heller may be studied by consulting the following thirty five references:

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ART. II.—ANÆSTHETICS IN VETERINARY PRACTICE.

The most efficient method of accomplishing anæsthesia in animals that are to be subjects of severe surgical interference, is a topic of prime importance to every one who is interested in veterinary medicine. In human practice, and with small animals, the difficulties are trivial and easily surmounted, while in horses the task has always been regarded as formidable. It is the object of this brief paper to describe a method that is simple, effectual and inexpensive. It will be remembered, that after the animal has been thrown and anæsthetics are given, it has been customary to apply the ordinary cone, made of paper and cloth, and containing a sponge or cotton soaked in sulphuric ether or chloroform; or, in other cases, an almost air-tight nose-piece has been used. In either case both nostrils and mouth have been covered, and the expenditure of the anæsthetics has been large, but much less in the latter than in the former.

A plan, which the writer thinks may have first been used by himself, is now proposed; it is carried out as follows: The horse having been thrown and temporarily secured, the operator immediately takes advantage of the known fact that most horses breathe through the nostrils only; he accordingly closes the inferior nostril with his hand, or that of an assistant; the animal is now, of necessity, compelled to breathe entirely through the other, or superior nostril. A small cone is now brought into use; it should be just large enough to tightly cover the superior nostril, and thus completely exclude the entrance of all air. The quantity of air required to oxidize the blood during the administration of the anæsthetic, can be governed by the inferior nostril, and yet the inhalation of the anæsthetic need not be interfered with.

When all the details of this method are precisely followed, the writer is confident that every veterinary surgeon will testify that ounces can do the work that formally required pounds. It will need some skill and practice to successfully meet all the requirements necessary to administer any anæsthetic in this way, but the same is equally true of all the methods.

As there are a few horses that can breathe through the mouth almost as well as through the nostrils, this plan of etherization will in those cases have to be aided by any apparatus that will close the mouth tightly. Some animals seem to be unable to breathe through the mouth even when completely under the influence of an anæsthetic; but the question arises, will not the majority, when completely relaxed by ether or chloroform, be able to breathe through the mouth? Although they may not be able to expire freely through the mouth, there seems to be no good reason why they cannot inpire air into the lungs through that cavity. The writer has not as yet been able to extend his observations sufficiently to positively demonstrate this point, but would be happy at any time to hear the experience of those who may have occasion to resort to an anæsthetic. The writer, by this method, was once able to bring an animal pretty well under the influence of the anæsthetic, with four drachms of sulphuric ether; just at this point the palate became relaxed and the animal breathed freely through the mouth. But by closing the mouth tightly this will be found a very economical way of administering an anæsthetic.

This simple plan will always suggest itself to those who are desirous of carrying out an ordinary operation, but are embarrassed by the expense of the anæsthetic. It is as yet an undecided question just how much can be saved.

The plan of etherizing a horse standing, or without first throwing and temporarily securing, will be a decided advance in veterinary science, but will always require a larger quantity of the anæsthetic than would be used when the animal has been thrown and placed under perfect control.

Up to the present time veterinary surgeons have devoted most of their energy to giving reasons for not using anæsthetics, which unfortunately have been principally that of the expense of the drug. A few of the reasons why anæsthetics should be universally used in severe operations are, the dangers to the life of the animal from breaking the back, rupture of the diaphragm, and shock. This last cause, shock, may at first seem a bold term.

First, the throwing of the animal can be easily accomplished, but to cast a horse and have him go through all his struggles without breaking his back, is probably a thing which no veterinary surgeon of any considerable experience has always succeeded in accomplishing. By immediately using an anæsthetic as soon as thrown, there would be the least possible chance of this accident.

The second danger is that when an animal is thrown and securely bound, the whole force of the animal's struggle seems to be exerted upon the diaphragm, it ruptures, and death instantly follows. By a speedy use of an anæsthetic this accident could not occur.

The third reason for using an anæsthetic is the condition which the writer has thought justifiable to call shock. The reason for using the term shock is the well-known fact, that horses when bound and under the knife, or when simply under the knife, "struggle and fight until they are subdued," as it is called, but this subdued condition is, without doubt, identical with the condition known as shock in human medicine. That is, the horse stands or lies trembling, as if unable to move or make further resistance; he is covered with a cold perspiration; the temperature falls, the pulse is small and fluttering, and death frequently follows these symptoms. It has often happened to the veterinary practitioner that after a horse has been cast and "peacefully submitted to the operation," when loosed from his bonds, instead of getting up as the veterinary surgeon in charge would like to have him, he has died where he lay when operated on. Death in such cases is, without doubt, from the condition termed shock. Were this accident to occur in the case of a valuable and blooded animal, the few dollars saved on the anæsthetic could never repay the loss sustained by the owner; or, the damage to the veterinary surgeon.

As a general rule it is in the high-blooded, spirited and nervous animals that this accident—death from shock—is most likely to occur.

It appears to the writer that these three fatal consequences, without mentioning any of the more trivial accidents, or even bringing up the great and all-important question of humanity to animals, would be all that is required to make the use of anæsthetics as universal in the veterinary as they have become in human medicine.

These few facts ought to lead every veterinary surgeon to make a thorough and constant study of the subject, until the use of anæsthetics can be brought to the minimum of ease, safety and expense. There is no reason why this end cannot be accomplished, and the success of comparative surgery raised to a plane, equally as high as human surgery.

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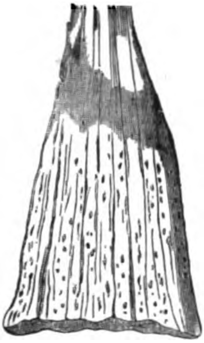
ART. III.—DISEASED MEAT AND ITS CONSEQUENCES UPON OUR HEALTH AND HAPPINESS.

TRICHINOUS PORK.

PART II.

There is probably no condition of diseased meat more inoffensive in general appearance, and therefore more liable to be overlooked in the culinary process, than the one caused by the presence of minute worms in the flesh of swine. Such meat is exceedingly dangerous as an article of food, and may give rise to one of the most obscure and intractable maladies that the physician has to contend with in human practice. These famous microscopic entozoa that so frequently contaminate our pork, and are known among naturalists as the *Trichina spiralis*, present in their evolution three well-marked stages of existence for us to study, which really anticipate the larva, pupa, and imago phases of development in the winged insects. The natural history of this flesh-worm, therefore, becomes not a little interesting and worthy of special notice in this connection when we endeavor to explain the precise manner of its infection, the phenomena of certain symptoms, and the ultimate cause of death in the human victim.

Figure 1.



A portion of human muscle showing the cysts of the Trichinæ spiralis, natural size

This parasite was first described and named by Prof. Owen* of London, in 1835, and though frequently seen by scientific observers, it was only regarded as a microscopic curiosity for more than a quarter of a century. His attention had been indirectly called to the subject some two years previously by John Hilton, demonstrator of anatomy at Guy's Hospital Medical College, who had observed a peculiar appearance of human muscle, and thought that it depended upon the formation of very small *cysticerci.* He made a communication to the Medico-chirurgical Society which was deemed worthy of publication, and this is probably the first account we have of the abode of the worm in question.*

Mr. Wormald, the demonstrator at the St. Bartholomew school, had frequently observed the same abnormal and speckled condition of certain muscles. The gritty sensation he had perceived, and the blunting of the edge of his scapel in dissecting, caused him one day to mention the fact to Prof. Owen. This led to some inquiries concerning the nature of these little calcified bodies in the flesh, and the distinguished anatomist at once requested a specimen for microscopic examination, as seen at Fig. 1, from the next subject he should find thus infected. It was not long before his wish was gratified, but ere he had time to investigate the matter, one of the students, now better known as Sir James Paget, dissected some of the calcareous cysts, and with the aid of a microscope, which he borrowed from Dr. Robert Brown, the well-known botanist, he actually saw the living entozoon first.†

Dr. Vogal in his description of the cyst gave it the appellation of "cocoon," believing that it was formed by the ingenuity of the parasite. Owen found each capsule to contain from one to three small hair-like worms,‡ invariably coiled up, hence he gave it the very appropriate zoological name the parasite now bears. As this examination was made with a low magnifying power, he did not perceive that the little *helminth* had any internal organization; he therefore arranged it among the lowest of the entozoa in his new-made class *Protelmintha.* But Dr. Arthur Farre,* by his careful dissections, soon distinguished an alimentary canal, which at once elevated the parasite in the classification of naturalists to the order of nematoid worms.' Yet he was unable to decide which was the anterior extremity, and for nearly fifteen years there was no advance of anatomical knowledge on the subject. It therefore remained for Prof. H. Luschka, of the Tubingen University, in 1850, to point out more accurately the internal structure. He carefully traced the digestive canal, discovered the sexual organs of the female, and conclusively proved that the mouth was situated in the pointed end of the worm, and not in the blunt extremity, as was generally believed. He described the cyst in its advanced stages, and demonstrated, for the first time, a complicated system of blood vessels, and an external membrane of connective tissue by which it is surrounded. In his observations on the vitality of the trichinæ, he found that they survived putrefaction and freezing of the muscles. Dr. Herbst, a German helminthologist, followed in this line of investigation, and his experiments on dogs actually solved the question concerning the propagation of trichinæ. He was the first to rear encapsuled flesh-worms in the muscular tissue, and claimed that in this state only they were transferable from one animal to another.

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* Transactions of Zoological Society, Vol. I, page 815.

† See London Medical Gazette, Vol. XI, page 605.

‡ Cyclopédia Anat. and Phys., Vol. II, page 126.

Dr. Kuchenmeister having previously shown the transformation of measles or hydatid tæniæ into tape-worms, was led to the supposition that the trichina might be a juvenile form of a known nematode; and after a series of observations, he declared that this flesh-worm was the larva of the *Trichocephalus dispar.*†

A new impluse was given to trichinal investigation in 1859, by Prof. Virchow's experiments. He fed a dog upon trichinous meat, and in four days found a large number of these nematodes fully developed and sexually mature in the intestines, but he failed to observe the migration of the new-born worms which Herbst had previously demonstrated. This was owing partially to his having killed the dog too early, and also from the fact that he selected an old animal for the experiment, through whose firm tissues the young trichinæ scarcely ever penetrate.

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* London Gazette, Dec., 1835.

† Animal and Vegetable Parasites, Sydenham Ed., Vol. I, page 321.

Dr. Zenker of the Dresden Medical School supplemented these observations, and threw much light upon the subject in a medical point of view. He found, upon microscopic examinations, free and living trichinæ in the muscles of a servant girl who died in the hospital, at the age of twenty, of what was supposed to be a typhoid fever. She was taken ill January 12, 1860, and fell a victim to this strange malady within a month. Her symptoms were severe, and in some respect resembled rheumatism, with painful swellings of the limbs. The history of the case, therefore, was of more than usual interest to the profession, and excited not a little clinical inquiry, but no one mistrusted the cause of the trouble. It was soon ascertained, however, after Zenker's post-mortem disclosure, that she had assisted in the making of sausage on the 21st of December previously, and that she had partaken of some of the raw meat only a few days before her illness. This led to his well-known investigation on the nature and pathology of trichinosis, which has been so extensively published to the world, and will ever crown his life with honor. The discovery of this violent parasitic disease in man aroused at once the zeal of professional experts and veterinarians, and was the dawn of a new era in sanitary science.

Prof. R. Leuchart,* of Giessen, followed up the researches on the embryology of the parasite ; he made a series of experiments on trichinal infection that were very comprehensive, and did much to advance the science of helminthology. He corrected his own previously expressed opinion on the validity of Kuchenmeister's observation on the transformation of the flesh-worm into trichocephalus, and thus confirmed Virchow. He also showed that the young trichinæ in the intestines became the encysted worm in the muscles, and he believed that they reached there by migration through the tissues, while others claim that the distribution of the trichinæ over the body in so short a time can only be effected through the circulation of the blood.

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* For a summary of his views see Burk's translation in Quar. Jour. of Microscopical Science, Vol. VIII., page 168

Dr. Thudichum,* who has made extensive researches on the parasitic diseases of food animals, says concerning this worm, that the red voluntary muscles are the "promised land" of the trichinæ. There they migrate, grow, and enshrine themselves. Although the young trichinæ, on the seventh day and later after infection, are found in almost all the organs of the body, yet they do not grow or become encapsuled in any other tissue. The trichinæ arrive in the muscular tissue with the blood. The diameter of the smallest capillaries in the muscles is much less than the diameter of the young trichinæ, so they are certain to be arrested. They then penetrate the simple or double coats of the muscles, and are at once in the interstitial spaces between the muscular fibres. Many trichinæ unquestionably never enter the sarcolemma, and become encysted, but when they do the fibres become permanently destroyed. At the end of the third week after immigration, the inflammatory irritation of the muscular fibre has reached its highest point, the trichina is nearly full grown, and becomes fixed to the spot where it is to be encapsuled. Several of these worms may wander in the same track, and ultimately be enclosed in one lump of exuded matter.

It is in the encysted state, as seen at Figure 2, that the trichina is transported from one flesh-eating animal to another. Pigs are not born with these entozoa, but get them in some kind of food, probably from the flesh of rats and mice, and when once swallowed by the hog or other animal, the gastric juice, in the process of digestion, soon dissolves this albuminono-cretaceous cyst, when the parasite will be liberated from its prison life, and in a few days becomes a full-grown worm.

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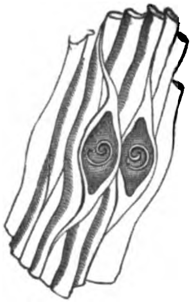
* See his able paper on the subject in the 7th Public Health Report of the Privy Council, London, 1865.

Figure 2.

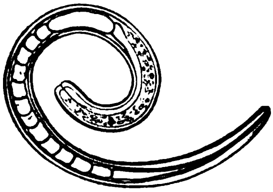


A portion of ham, showing two cysts of the Trichinæ spiralis enclosed, slightly magnified.

The sexually mature female, according to Prof. Cobbold,* is one-eighth of an inch in length, while the male is only about two-thirds that size. The female is ovo-viviparous, and thus brings forth its young alive within the stomach and intestines. The young trichinæ begin at once to migrate from the bowels and perambulate the entire system of voluntary muscles; at last they become encased, and there remain for ever at rest, until they, perchance, shall have been eaten by some other animal, when they, in turn, will be set free, and thus complete their final destiny.

This parasite, which undoubtedly infects a large number of animals, has frequently been found in the rat, mouse, cat, hedgehog, fox, mole, and hog, and is liable to be transmitted from one carnivorous animal to another through the meat. The Commission of the Royal College of Physicians of Vienna report that the main source of the infection in the hog is from the rat, and nearly one-half of all these vermin examined in Moravia were found infected with the encysted trichinæ; and it is not improbable, as Fleming observes, that the rats were primarily infected, and have thus transmitted these parasites from one generation to another by virtue of their carnivorous habit, at times, to devour each other.†

Figure 3.



Trichinæ magnified one hundred times.

Although the swine of every land may occasionally be infected with this noxious parasite, still the frequency of its transmission will depend in a great measure upon the habits of the people. In those countries where the practice of eating raw pork and sausages so extensively prevails, of course the parasites contained in the flesh will be transported to the human stomach unmolested, but no fears need be anticipated from even the free use of pork if it has been subjected to a sufficient degree of heat in the process of cooking, to destroy every germ of animal life; then it would be as harmless from this cause as fish, beef, or venison.

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* See his Entozoa—An introduction to the study of Helmintholy, with Supplement. London, 1869.

† Veterinary Sanitary Science.

The ravages of this loathsome malady from the use of diseased pork are not confined to any country, and I believe it prevails more extensively than is generally supposed. Dr. George Sutton, of Aurora, Indiana, who has been examining pork killed in the State, says he has found from three to sixteen per cent. of the hogs affected with this disease—differing in various localities—and that, taking the rate at four per cent., we have put upon the market, from the Western States, 221,484 diseased hogs, or about 44,296,800 pounds of infected meat, every ounce of which might produce disease.* And the Committee of the Chicago Academy of Science has shown that the percentage of swine infected by the trichina in the Western States is greater than in Germany. Still, the disease is of rare occurrence on this side of the Atlantic, compared to the old country; and we can ascribe no cause for the greater prevalence of this disease in Germany, except it be the habit of eating their ham or sausage in the raw, or uncooked state.

The symptoms of trichinous infections in man will depend largely upon the quantity of diseased meat that has been eaten, and also upon the stage of the malady. At first it is marked by local irritation within the intestinal track, before the worms begin to migrate. This gives rise to nausea, loss of appetite, inflammation of the mucous surface of the bowels, and diarrhœa. Peritonitis may sometimes occur from the perforation of the intestinal walls.

The second stage is characterized by general symptoms, muscular pains, rheumatism, etc., occasioned by the migration of the worms in the various parts of the body. There is great soreness, œdema, and stiffness of the muscles. Lassitude and profuse sweating not unusually occur in severe cases, and in this respect it resembles typhoid fever, for which it has many times been mistaken. This stage commences in about ten days from the first illness, and lasts four or five weeks.

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* A report on Trichinosis, from the Transactions of the Ind. State Medical Society, 1875.

In the third phase of the malady the trichinæ have become encysted, the fever, soreness, and inflammation begin to abate, and the patient is in a fair way to recover. In many cases there is a complete restoration to health again, but often it leaves the system in a very prostrate condition, according to the amount of muscular lesion that has taken place.

Thus our only safety from the use of pork, which is always more or less liable to contain trichinæ in any portion of the country, is thorough *cooking*. Salting and smoking, unless long continued, has but little effect upon the vitality of these parasites. Raw ham or sausage should never be allowed upon a sanitary bill of fare; and even boiled ham, when large and fashionably prepared, as seen in many of our eating saloons to-day, not unfrequently contains these living worms. Hence our lives may be prolonged and our health improved by more attention being given to the domestic duties of the household. Then will all meats be served upon our table in a manner both to nourish and promote our happiness.

MEASLY PORK AND BEEF.

This condition of diseased meat is caused by the presence of a larval form of a tape-worm known as a *scolex* or a *hydatid* in the flesh, thus giving it the spotted appearance of the measles, and consequently this term has been applied to the parasite. There are several points of resemblance between the life-history of the tape-worm and the trichina. The measles are the young entozoa in the encysted state and likewise are received into the stomach with the meat, when they become liberated in the process of digestion and grow into the mature parasite. But tape-worms do not multiply like trichina in the human body. Each one comes from a hydatid measle that has been eaten.

The posterior segments of the tape-worm ripen and fall off, and are known as progottides. Each one is sexually complete, a hermaphrodite, and contains a multitude of mature ova; and when eaten by other animals the eggs, set free in the stomach, readily hatch, and the embryo worms with their six hooklets or spines arranged about the head soon perforate the intestinal walls, enter the blood-vessels, and are transported by the circulation to all parts of the system. Being therefore a foreign body in the flesh, inflammation ensues, and they are soon enclosed by an exudation thrown out for protection, and thus a cyst is formed where they develop into a measle, or the *cysticurcus celulosæ* of early authors.

The larval cestode which infests the measly pork is the sexually undeveloped progeny of the armed tape-worm known as the *Tænia solium* of Linnæus. And while the pork measles have been found in the flesh of other animals, the adult parasite seems to claim no other host than the human intestine. The pork tapeworm is probably the best known and by far the most prevalent. In fact, this intestinal parasite is only too frequently the pork-eater's guest. It is therefore obvious that the measly condition of the flesh of swine is the real source of danger.

Hence the necessity for more precaution on our part in rearing these animals for home use, or for the general market. Thus, a person harboring a single tape-worm may be the means of contaminating many hogs, for each mature segment cast off contains thousands of eggs ready to hatch when taken into the stomach of other animals. Consequently, swine should never be allowed access to privy dwellings, nor to compost heaps containing night-soil. Better sanitary regulations are therefore demanded even in the homes of the affluent.

The beef measle, when eaten by man, develops into the *Taenia mediocanellata*, which Kuchenmeister first described and named.* This tape-worm was looked upon for a long time simply as an unarmed variety, but it is now known to be a distinct species. It is larger than the other, and the joints are wider. This parasite occurs among beef-eating people, and is quite common in America and European countries. In fact, it prevails most extensively among the Jews and Mahommedan nations, where pork is not used, thus showing conclusively that the broad, unarmed tape-worm comes from the use of measly beef and veal.*

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* Animal Parasites, vol. 1, page 133.

The same sanitary measures will be required to protect the cattle against this larval infection. Their voracious habits sometimes will cause them to eat strange substances. Cattle should therefore not be permitted to frequent those places where human ordure has been left, or to drink from dead ponds that receive the wash from dwellings, especially when it is known that people in the neighborhood are infested with the beef tape-worm.

Though our staple articles of meat may be affected with these larval parasites, yet thorough cooking renders all such flesh perfectly harmless. Raw pork, veal, and beef are dangerous articles of food unless a microscopic examination has been made to determine the possibility of any parasitic infection. And Prof. T. Spencer Cobbold of the Royal Veterinary College, who by his original researches has contributed so largely to our professional literature on this subject, has announced the discovery of a mutton measle, differing in some respects from those other two; but whether the resulting tape-worm will make its abode in man, and thus render the favorite flesh of sheep a diseased article also for human use, has not been determined.

The mature ova of the *Tænia solium*, when taken into the human body with food or drink, develop into the measle quite as readily as in the hog, and thus our own flesh is liable to become the bearer of these larval parasites, a single one of which may prove fatal. Hence, we should strive to guard against all such possible contingencies.†

BRAXY MUTTON AND BLACKLEG VEAL.

In this type of diseased meat we have a virulent blood poison to deal with which infects the entire carcass; and accordingly all animals dying from an anthrax fever in any form should be condemned. Yet we find that the flesh of braxied sheep is a favorite article with many, and some even prefer it to the best dressed mutton in the market, claiming that it is more wholesome and easier of digestion. Such a taste of course must be an acquired one, like that of the epicures who seem to relish their game the best when in a state of decomposition. And some forms of braxy mutton are in a similar condition, being soft and putrid many times as soon as the animal is dead.* Such practice is much to be reprobated says a practical shepherd,† although it is almost universal among those connected with the stock in every district where the disease prevails, and in some places large quantities of hams are salted and dried; and from the amount consumed in certain localities there is no doubt but that it is the cause of many blood poisons among the people.

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* For further account of these measles see Prof Verrill's able paper on Internal Parasites, in the Secretary's Report, 1869.

† See supplement to his large work on the Entozoa, 1869; and also his new Manual on the Parasites of Man and Animals. London, 1879.

Instances are not wanting where blackleg veal and other anthrax varieties of flesh have been eaten with impunity. There is evidently a great difference in the intensity of the malady. Sometimes the poison may not be fully elaborated, and consequently the virulency of the meat will be less energetic. Thorough cooking may do much to destroy these infectious properties, yet the extensive alterations that have taken place in the tissues and the rapidity with which putrefaction sets in are sufficient reasons, on sanitary grounds, to absolutely prohibit the use of all such diseased meat.

The nature, history, and symptoms of two very malignant anthrax maladies in cattle—splenic apoplexy and charbon—will be found treated at some length in relation to the diseased meat question in my third report, as State Veterinary Surgeon, on the Diseases of Domestic Animals within your State.‡

THE LUNG PLAGUE.

The question of the wholesomeness of meat from animals affected with pleuro-pneumonia is one of much moment to us to-day, and in view of the increasing prevalence of the malady in this country, it is worthy of our consideration and of our expressed opinions for the public good.

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* See Robertson's Prize Essay on Braxy in Transactions of the Highland and Agricultural Society of Scotland, Vol. 19.

† Cowan's Essay on Braxy, in the 18th Vol. of the above transactions.

‡ In the Secretary's Agricultural Report of 1873. See also Fleming's Veterinary Sanitary Science.

Since the first introduction of the lung plague in 1843, the herds of the New England and Middle States have not been free from its local ravages. During its history of thirty-seven years upon our virgin soil, the germs of this contagious malady have become so effectually disseminated along the Atlantic coast, that fresh and unexpected outbreaks are now of frequent occurrence, especially in the vicinity of New York, where the disease first made its appearance.

The western movement of our thorough-bred stock of late years has opened new channels for the development of the disease; and unless immediate action is taken by Congress to intercept the impending scourge, these potent germs will ere long be found lurking among the vast herds upon the plains, if not already wafted there by the trend of civilization.

The cattle of Connecticut, for some time past, have been more or less affected by this disease, and thrice have we been called upon as a Commission in the last ten years to stay its progress. And still there is more work to be done which the next Legislature, in its wisdom and economy, cannot ignore. And should pleuro-pneumonia, the dreaded plague of our land, ever become through political neglect a general epizootic, and thus sweep across the continent, decimating our herds upon the hilltops and plains, we are not without a bright sanitary consolation in such an event to cheer the poor and broken-hearted, for the meat from thousands upon thousands of our fine animals, that must of necessity fall victims in its march, if slaughtered at an early stage of the malady, could be utilized in a great measure to feed the hungry and needy without a fear of dangerous consequences to the health of our panic-stricken millions.

Thus our great dread of the extension of the lung plague is not on account of any infectious condition of the meat, for millions of those affected animals, according to Fleming, have been consumed as human food in various parts of the world, and no vil results have been known to follow. In Great Britain and

France, there has been for years a regular trade with the butchers in cattle affected with the contagious form of this disease, and yet the sanitary condition of the people remains unimpaired. But it is the immense loss to our live stock property that would be entailed by such a calamity.

CONCLUSION.

Of the other maladies which are liable to effect our meat supply, the foot and mouth disease is one that is much to be dreaded. And though the flesh of such affected animals is believed to be harmless, yet the milk, under certain conditions, is a dangerous article of food. But observers are not agreed in relation to the matter. The same is true in regard to hog cholera and several other forms of disease, the pathology of which is not sufficiently well understood to enable us, at the present time, to solve the various sanitary questions here involved.

Hence the necessity for a competent veterinary inspector in every State, whose professional duties to the public have already been outlined, in the consideration of our theme. And as we have seen that our health and happiness is frequently involved in the very meat we eat, such an officer, in watching the development and progress of these infectious maladies among our food-producing animals would thus serve as the true guardian of human welfare.

NOAH CRESSY, M. D., Ph. D.
Hartford, Conn.

Art. IV.—STERILITY OF MAMMALIA UNDER CONFINEMENT.

When it is remembered that all of our domesticated animals are the descendants of progenitors which originally lived in a wild state, it will readily be conceived that the semi-domestication of wild animals in menageries seldom fails to produce constitutional changes of greater or less extent. These may be displayed in the immediate bodily form of the animal, but are more commonly confined to the deeply lying functions which serve to the perpetuation of the race. There is probably no exception to the rule that confinement lessens fertility in wild animals when they are first subjected to it. It may range in all degrees, from apparently absolute incapacity to breed, to the merely impaired vigor and irregular or incomplete development of the young, found in many species where the numerical production of offspring goes on with tolerable regularity This state of affairs is very common in zoological collections, and offers a most interesting field of observation to the comparative physiologist. Without entering, however, upon an exhaustive review of the subject, a brief statement of the facts will, perhaps, not be without interest.

It is probable that this want of productiveness may be eliminated in time, but observations to that effect are made difficult by the fact that wild animals are kept mainly for purposes of exhibition, and in such small numbers that the injurious effects of inbreeding soon enter into the question and greatly complicate the result; it is universally acknowledged, however, that domesticated races of animals are more prolific than their nearest wild congeners, although there is some evidence to show that very great changes in the conditions of life do, in some cases, lessen the fertility of animals which have long been domesticated.* Man is, as has been said, "the most highly domesticated of all animals," and in him the generative system has reached its most perfect freedom from the influences of surroundings—under all climates, all seasons, all changes, he perpetuates his race with uniform regularity, adapting himself to conditions which would otherwise bear severely upon him in this respect. On descending, however, to the highest type of structure to be found among the lower animals, the reproductive faculties are seen to be impaired almost to the greatest degree. Few instances of monkeys breeding in confinement are to be found. Among the higher apes there has been but a limited field of observation, the few that have been kept generally being too young to afford full scope for the exercise of the sexual instinct—they all seem exceptionally delicate, however, in constitution, and there is no reason to suppose that they would be free from the conditions existing among their kindred.

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* Darwin: "Animals and Plants under Domestication." Vol. II., p. 144.

During a period of twenty years, out of seventy-five species of monkeys and lemurs, kept in the London Zoological Garden, but twelve produced young; and in the Philadelphia Garden, in six years, during which time as many as sixty individuals were kept together, affording the fullest possible opportunity for intercourse, but five births took place, belonging to three species of the genus *Macacus*. In the group of American monkeys but two cases are recorded, one belonging to the genus *Cebus*, in London, and a marmoset in Paris. It is stated by Rengger and Azara that these monkeys will not even breed in their native country when kept as pets.

Among the *Cheiroptera*, several of the large fruit-eating bats have bred in Europe, but so far as may be known, no such event has occurred in the carnivorous branch of the order.

Of all the true *Carnivora*, the cats appear to be most fertile, several species—as the lion and leopard—breeding with some readiness, the tiger rarely, and the smaller species with more or less freedom. It is worthy of note that the female tiger apparently breeds more readily with the male lion than with one of her own species. Even where absolute sterility is less marked, however, a disturbance of the reproductive system is commonly shown by a tendency to abortion, by a strange perversion of instinct which, in many cases, leads the mother to devour her young, and by weak constitution and generally poor development in the offspring.

The hyænas seem to reproduce with facility, as likewise do some of the wolves, though to a less extent. Few of the foxes have ever been bred in confinement, and those which have, were for the most part hybrids with other species or with some variety of the domestic dog. The small carnivores breed with much difficulty, and in few cases, but it is among the bears that the disinclination seems to reach its maximum—the only cases of which record can be found, being confined to the polar bear and the common black bear of North America, while in England, hybrids were once produced between this species and the brown bear (*Ursus arctos*) of Europe. Of the other plantigrade carnivores, the common raccoon and crab-eating raccoon have bred a few times, and an allied species, the coati, of Central America, has produced young on several occasions, both in London and Philadelphia. Seals have hardly been kept in sufficient numbers to arrive at any sound conclusion. The common seal (*Phoca vitulina*) once produced young in the London Garden, and a cub of a species belonging to a distinct family of the order (*Zalophus gillespii*) was born in the garden at Cincinnati; but in the first of these cases, and probably also in the last, impregnation had taken place before the capture of the animal. In the fall of 1879, however, a female *Zalophus* died in Philadelphia which had been in the garden for two years and a half, and on opening the uterus an embryo of some weeks' development was found, thus showing the capacity of the species to breed in captivity. There is a noticeable want of regularity in the rut of these animals in comparison with what appears to take place in a condition of nature.

Most of the *Rodentia* seem to breed with somewhat less readiness than the members of the last group—in London, eleven out of fifty-two, and in Philadelphia, eight out of forty-one species having bred, and in almost every case with an apparent diminution in the number normally contained in a litter. Several species of the South American genus, *Dasyprocta,* are among the freest breeders, and the capromys has bred several times, producing only from one to three at a time. None of the true squirrels have ever shown any inclination to breed in confinement, though several allied species, as the woodchuck and prairie dog, do so frequently.

The elephant has, until recently, been considered as the most striking instance of complete suppression of the sexual functions, few cases of birth having taken place even under the conditions of semi-domestication in which they are kept in India. The example has been somewhat weakened, however, by the birth in March, 1880, of one of the Indian species, in the menagerie of Messrs. Cooper & Baily, at Philadelphia, and by the apparent pregnancy at the present time, of another female in their collection, by the same male.

It is among the ungulates that the nearest approach to free breeding is found. Most of the deer, antelopes and oxen breed under very considerable diversities of climate, yet even here the loss of procreative power is strongly marked. The American elk, or wapiti, is probably one of the hardiest of the family, and of its domestication in a park, in the State of Illinois, where it had free range over several hundred acres of woodland and pasture, a most competent observer* says: "The result of my experiments shows that the confinement of this deer in parks, even of considerable extent, impairs its reproductive powers. . . . . In the wild state the female is believed to breed at two, or, at most, at three years old; the young females producing one fawn at a birth, and the old ones generally twins, and three are sometimes produced at a birth. The fact that in my grounds the females never, to my knowledge, have bred before four years old, and never, I think, more than two-thirds of them in any one year, and that twins are of very rare occurrence certainly shows a sad degeneracy."

Similar results are obtained with the common, or Virginia deer. In the mule deer (*Cervus macrotis*), which breeds with some freedom, the fawns are so weakly that, hitherto, all attempts to raise them have resulted in failure. Of six bred in the Philadelphia Garden, five showed a want of assimilative power which could not be overcome, and all died early from its results; the last one born, at the time of writing is over four months old, and though not healthy, promises better than any of its predecessors which succeeded in reaching that age. In every case the mother showed a decided want of the instincts proper to the occasion, neglecting the young one after the first few days, and giving it but a scanty supply of milk. In the last case the fawn has been raised altogether by hand.

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* Hon. J. D. Caton, "Antelope and Deer of America," p. 295.

Disturbance and irregularity in the activity of the reproductive system in the deer is also indicated by the frequent occurrence, under confinement and independently of injuries, of improper development of the antlers, which are, perhaps, the best illustration, among all mammals, of a secondary sexual character; although inferences to be drawn from such malformations, are somewhat obscured by the consideration that the extent to which they occur under nature is not accurately known.

Many of the antelope and ox tribe are reasonably fertile; the giraffe has bred a number of times in Europe, and the camels and llama domesticate with ease. The hippopotamus has bred in London and Amsterdam, and several of the young have been raised. With the rhinoceroses and tapirs sterility seems to be marked—intercourse between a male and female of the latter has been frequently observed in the Philadelphia garden, but so far with no result. Of the zebras and quaggas several species have produced in Europe, but generally when crossed. Some few of the pig family also breed—the collared peccary of Central America has done so, both in Philadelphia and London, while a very closely allied species, the white-lipped peccary, is so sterile that it rarely reproduces, even when half domesticated in its own country.

Several species of *Edentata*—sloths and armadillos—have bred within a few years past in the London garden.

The marsupials appear to follow the ungulates in order of fertility, almost all herbivorous types of the order having been represented in London by breeding species, and some of them—notably the kangaroos—have done so elsewhere. The carnivorous forms are exceedingly sterile.

The common opossum, of North America, has on several occasions produced from eleven to thirteen young in the Philadelphia garden—nearly the average number contained in a litter—but they have bred but once in a season.

Of the lowest mammals (*Monotremata*), a sufficient number have not been kept to admit of any observations being made.

The table following shows the number of species which have bred, out of the total number kept in the gardens of the London and Philadelphia Zoological Societies, the only ones from which sufficient material is at hand for such a compilation to be made:

	LONDON.			PHILADELPHIA.		
	NO. OF SPECIES KEPT.	NO. OF SPECIES BREEDING.	PROPORTION	NO OF SPECIES KEPT.	NO. OF SPECIES BREEDING.	PROPORTION
Quadrumana,	75	12	1 in 6.2	46	3	1 in 15.3
Chiroptera,	1			3		
Insectivora,	1					
Carnivora,	77	24	3.1	44	7	6.1
Rodentia,	52	11	4.7	41	8	5.2
Proboscidea,	2			2		
Hyraces,*	1	1	1.			
Ungulata,	94	46	2.2	41	13	3.1
Edentata,	7	1	7.	4		
Cetacea,	1					
Marsupialia,	28	11	2.5	19	4	4.7
Monotremata,	1					
Totals,	340	106	3.2	200	35	8.

The differences between the two tables in the proportion of breeding species, may be explained by the fact that the observations in London cover a period of twenty years,† while those in Philadelphia include only six years—the time during which the garden has been in existence—the greater length of time and the greater number of species kept in the former, affording a much wider field for observation.

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* (In comparing the relative fertility of different orders, the hyrax should, perhaps, be omitted, it being the sole member of its order.)

† Sclater. Proc. Zool. Society. 1868. p. 623.

In the present state of knowledge no one cause can be assigned sufficient to account for this general range of sterility—it cannot even be definitely said whether the change of external conditions, or the inherent constitution of the animal itself, is the most important factor in the problem, as closely allied species often show a most extraordinary difference in the rate of fertility under conditions of equal change. By a system of exclusion it is possible to shut out from special prominence, each one of the greater modifications of surroundings to which wild animals are subjected after capture. If change of climate or food be held to account for the deterioration, what could be more remarkable than that the polar bear should breed, under a temperate climate, and an almost exclusively vegetable diet, as it has done in London? or that giraffes, elands and ostriches from the hot, dry plains of Africa should reproduce with some facility, as they do in various parts of the temperate zone? or if the loss of exercise attendant on confinement in cages and small enclosures, be taken as chiefly contributing to the result, what explanation can be offered of the lessened productive power displayed by many animals, as for instance, the wapiti and common deer of America, when ranging in large parks within the limits of their natural distribution? Loss of the sexual instinct is not to be regarded as an explanation, for with many animals which do not breed at all, or with extreme difficulty, constant evidences are given of a desire to gratify the feeling; nor can impaired health be a leading cause, for many of these same species are long-lived and full of vigor under confinement.

A suggestion has been made by Mr. Herbert Spencer,* to the effect that as the nitrogenized elements of food are most necessary to the formation of the embryo, they probably also play an important part in fitting the reproductive organs for the exercise of their function, and that its impairment may be directly owing to a deficiency of such elements in the food of captive animals.

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* Principles of Biology. Vol. ii, p. 462.

Considering, however, the great variety of foods used in zoological collections, it is hardly probable that a deficiency in any one class of nutritive elements would be so general as must be required by this hypothesis; furthermore, it does not seem to receive the support of the facts disclosed by the foregoing tables, as in such case we should expect to find the carnivora, whose food contains the largest possible proportion of nitrogenized matter (albumen, fibrin, musculine, and the like), and to which it it possible, under all circumstances, to give their native food, breeding with markedly greater facility than the animals of any other order; whereas they do so among mammals with only moderate freedom, and among birds, the sterility of carnivorus types amounts almost to an absolute refusal to breed. Among quadrupeds, the ungulates and marsupials breed with greater, and rodents with nearly equal facility, and with the two last the principal articles of food used in menageries are bread and potatoes, both of which are specially rich in the hydro-carbons (starch, sugar, etc.), while with herbivora generally—which, on the whole, seem to furnish the freest breeders—it is probable that a change from the fresh, green food of their life under nature, to the hay, corn and oats of domestication, is attended with a gain in non-nitrogenized material, rather than the reverse.

At present, the most that can be offered by way of explanation is, that the various changes of one sort and another, suffered by the animal, all concur to produce some constitutional modification, slight in itself, but yet enough to affect in different degrees the excessively delicate operation of the generative organs, which embody in themselves germs of every vital function. How readily these may be affected, we see further in the phenomena of hybridism, when their activity is commonly impeded, and often wholly annulled, in presence even of the slight constitutional differences which can exist between closely-allied species.

Indeed, though no direct connection has yet been traced between them, such a striking similarity appears between many of the class of facts we have been observing and those relating to the crossing of species, that it is hardly anticipating too much to say that when we shall arrive at even a partial understanding of that which lies at the bottom of the one series, we shall have some light thrown upon the now unseen causes which bring about the other.

ARTHUR ERWIN BROWN,
Superintendent of Philadelphia Zoological Garden.

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ART. V.—THE SANITARY CONDITION OF NEW YORK CITY STABLES.

In the City of New York, the animals of all kinds, for labor and for food, foot up to the enormous total, in round numbers, of six millions and a quarter (6,250,000). For the year 1879, the New York Produce Exchange furnishes the following tabulated figures: Beeves, 567,837; cows, 7,336; calves, 156,227; sheep, 1,507,739; hogs, 1,725,537. All these animals require temporary shelter and food till slaughtered. While living, the manure and filth accumulated by them will not fall short of 50,000 tons; and, including the offal after being slaughtered, the accumulations must reach the total of not far from 75,000 tons of the fittest soil for the propagation of contagious diseases. This manure and offal is widely distributed throughout the city, with a population of its own of a million of human beings, to which is added at least a third of a million of daily visitors. At the same time, and added to these food animals, New York houses and feeds 50,000 horses. The accumulations of manure and filth from these horses, in a year, amounts to 100,000 tons. For these 50,000 horses there are only 10,000 stables. Of these stables, not more than one in a hundred is in perfect sanitary condition. About one-quarter of the horses are kept in dark, damp stables, or places equally bad. These are the direct sources of most of the mortality of our city horses. As compared with the mortality of stables on the first and second floors, the mortality of the cellar stables is about as ten to one. But the diseases of the horses in the cellar stables rise to a higher ratio; for the horses in the first and second floor stables seldom suffer from rheumatism, neuralgia, malaria, and blindness, brought on by inflammatory affections of the eyes.

Horses suffer sadly from ammoniacal and other animal odors; and especially from the decomposition of all nitrogenous excreta. These produce ophthalmia and catarrhs, which deprive the owners of the use of their horses to a considerable extent, and which is a monetary loss, without taking into account the lessened working life of these horses, which is of greater importance than the temporary loss of use.

A horse or cow consumes at least seven times as much air as a man, yet only one stable in one hundred is constructed with an intelligent understanding of this indispensable demand for the health of the horse or cow.

Of the two thousand cow-stables, there are not ten which are in a sanitary respect perfect.

Of the ten thousand horse-stables, about three thousand have sewer connections. The stables of the road-horses are much better than those of the truck, cart, and other work-horses. These latter occupy mostly damp, dark, illy-ventilated stalls, the plank floors saturated with accumulations of urine and filth, which cause disease of the feet of the horse. These diseases of the feet of work horses form the most frequent cause of lameness. The poor man's horse suffers most from bad stabling, and he is the least able to bear the loss of the use of his animal.

Many of the city-kept cows sooner or later suffer from tuberculosis, because of the bad sanitary condition of the stables. The average life of the city cow is less than a third of that of the country cow.

The labor life of the city horse is about half of what it should be.

ALLEN S. HEATH, M. D.

[*To be continued.*]

ART. VI.—ENTERITIS.

The last and the most dangerous disorder of the intestinal track of the horse is known as Enteritis, or Inflammation of the Bowels.

Enteritis may affect the peritoneal or the mucous coat of the intestines; and in violent cases all the coats may be implicated. When the peritoneal coat is chiefly affected, the disease is known as Sero-enteritis. When the mucous coat is the seat of the trouble, the term Muco-enteritis is employed; but as it is almost impossible, in acute cases of inflammation of the bowels, to distinguish between the two forms, from the symptoms present, the term Enteritis is generally used—meaning either one or the other.

Any portion of the intestinal tube may be involved; but, according to Williams, the cœcum and colon are the parts most frequently affected. In two cases which terminated fatally under my care, the post-mortem examinations revealed that the small intestines were the seat of the trouble.

Acute enteritis proves rapidly fatal in very many cases, and often destroys life in a few hours.

Sub-acute muco-enteritis, on the other hand, is a very different form of trouble. It produces diarrhœa or dysentery, and, if allowed to go on unchecked, will cause death from exhaustion after weeks or even months of suffering. When we speak of enteritis, the acute form is generally meant, and that is the form we will consider here.

Causes.—Exposure to damp and cold, or washing a horse's body with cold water when warm, causing contraction of the cutaneous blood-vessels, thereby disturbing the circulation, limiting the amount of blood to the surface of the body, and producing engorgement of the deeper seated vessels, and congestion and inflammation of the parts that they supply. Now, if any particular organ or sets of organs are weakened from any cause, such organs are most likely to suffer, and if, in connection with exposure to cold and damp, a horse's bowels have been rendered predisposed by previous attacks of spasmodic colic, tympanites, mesenteric abscesses, intestinal concretions, diarrhœa or constipation, such exposure would be the indirect cause of inflammation of the bowels.

Spasmodic or wind colic, if not checked, may, and often does, terminate in enteritis. Irritating remedies, such as turpentine, ammonia, pepper, etc., improperly prepared, or given in overdoses for the relief of spasmodic or flatulent colic, frequently prove to be the direct causes of enteritis.

Symptoms.—As the symptoms of this disease closely resemble those of spasmodic colic, and as enteritis is frequently accompanied by tympanic symptoms, it is a matter of considerable difficulty to make a correct distinction between these three important disorders. Enteritis, unless preceded by spasmodic or flatulent colic, is usually ushered in by a chill. The pain is constant and of the severest kind, causing the animal to throw himself about in his stall in the most violent manner, or he may stand for hours in the same position, pawing the floor with one or both feet alternately, or he may stand perfectly quiet, as if afraid to move, now and then turning his head dolefully to his flank.

The pulse is increased in frequency, and thready, and soon runs up to from 80 to 120, and is then hardly perceptible. The temperature ranges from 104 to 106, or even 107. Respiration is short and quick, nostrils widely dilating at every inspiratory movement. The expression of the face is extremely anxious; cold sweats bedew the body. The mouth is dry, and the tongue seems parched and contracted. The visible mucous membranes present a deep red color, and pressure in the abdominal region causes the animal to groan with pain. The eyes acquire a wild, unnatural stare; the pupils dilate; the mouth now becomes cold, the breath cold and even fœtid; and in this condition the patient generally drops down, and dies after a few feeble struggles. In some cases the symptoms of agony and pain subside suddenly; the horse may stand quietly in his stall, and if food is offered him, may make a feeble attempt at feeding, and, to the inexperienced, the patient would seem to be improving, when in reality mortification has seized the inflamed bowel and pain is no longer felt. In this condition he may die within a few minutes, or may linger for several hours or even days; but death is sure to follow. The history of the case, particularly the manner of attack, the state of the pulse, the pain on pressure in the abdominal region, the peculiar, anxious expression of the countenance, the dryness of the mouth, and the elevation of temperature, may be considered as diagnostic symptoms of enteritis, and distinguish it from all other forms of abdominal trouble.

Treatment.—As the disease usually terminates fatally in a short period of time, the treatment must be very prompt. Opium, given in full doses per mouth, or atropia and morphia combined and administered sub-cutaneously, together with the judicious use of enemas, and strong counter-irritants to the abdomen, are about all that can be done. If the case is seen early, moderate blood-letting proves beneficial.

G. H. BERNS, D. V. S.

* * *

EDITORIAL DEPARTMENT.

THE PREVENTION OF INFECTIOUS DISEASES BY INOCULATION.

THE question whether acute infectious diseases can be prevented or mitigated in violence by inoculation has lately been brought into great prominence. Holland now announces that by inoculation and isolation it has rid itself of pleuro-pneumonia. If this is actually the case—and the facts are vouched for by Fleming—the question of inoculation for pleuro-pneumonia deserves further study from American veterinarians, by whom the measure is now generally condemned. But, in addition to the above reports, there have been a number of experimental investigations, which seem to throw some light upon the subject of inoculation, as a preventive measure, in many other diseases. Toussaint has experimented with the virus of anthrax, and claims to have modified it so that its inoculation causes a mild protective disease in sheep. Burdon-Sanderson and Greenfield have conducted similar investigations upon heifers, and claim similar results. Finally, Pasteur has announced that he has discovered a method by which he can obtain a true " vaccine matter" for fowl-cholera; that is to say, a material which is to the cholera what vaccinia is to small-pox.

We venture to give some details of M. Pasteur's alleged discovery, because, though we have but little faith in his bacteria, we do not consider it impossible that a " vaccine" may have been discovered.

M. Toussaint some time ago announced that he had discovered the specific germ of fowl-cholera in the shape of a microscopic organism, oval-shaped, multiplying transversely and capable of cultivation in certain fluids. Pasteur confirmed this discovery, and added to it by numerous experiments of his own. These resulted in the obtaining, by cultivation, a modified or weakened form of the virus, which when inoculated into healthy fowls protects them, as he claims, against the cholera. The way in which he obtained this protective matter was as follows: There are, he says, two kinds of chicken-cholera, an acute and a chronic. In the latter form, the poison seems to be stored up in the organs of the animal for some time; it finally works into the general system, and it then acts upon it very virulently, rapidly causing death. The acute disease is of a milder type, and does not always kill. Pasteur takes some of the secretions of the fowl containing the specific germs. These he cultivates in a decoction of the fowl's muscle. The organisms rapidly multiply for a certain time, and the mixture becomes turbid. It then clears up gradually, the bacteria settling to the bottom. It is found that the fluid will now allow of the development of no more of the specific organisms, even if a fresh supply of the most virulent kind is put in. The settled fluid is then allowed to stand for eight or ten months; at the end of that time, some of it is taken and placed in a fresh muscle decoction, when development and turbidity again appear. Now, if some of this second culture is inoculated in a fowl, it causes a very mild form of the disease, which, however, protects the animal against any further attacks, even when the strongest virus is employed against it. This attenuation and weakening is produced by the long interval between the cultures, as is shown from the fact that, if cultures succeed each other immediately, their virulence is unimpaired. Furthermore, the special effect is thought by Pasteur to be due to the action of the oxygen upon the virus; for if the fluids are kept during the intervals between the cultures in hermetically sealed tubes, they are as strong at the end as at the beginning of the experiments, no matter how long the time. These experiments of Pasteur are certainly very striking, and we hope they may prove to be true. But even if incorrect in many of his theoretical deductions, the work of Pasteur and other investigators points strongly to the possibility of securing a protective virus for many infectious diseases. It is a question that certainly deserves the fullest attention from pathologists and veterinarians.

THE EXPERIMENTS REGARDING ANTHRAX.—The experiments referred to regarding splenic fever were made by Burdon-Sanderson and Greenfield upon heifers suffering from that disease. The blood from a heifer with splenic fever was inoculated in a guinea-pig. This animal took the disease. Its blood was then injected into a healthy heifer. A slight febrile reaction followed, after which it was found that the animal was no longer susceptible to the poison of the splenic fever.

The experiments of Toussaint upon anthrax in sheep were conducted as follows:

The blood taken from a diseased animal was raised to a temperature of 131° F., and one-half of one per cent. of carbolic acid added. The mixture was then allowed to stand for two or three days, until the *bacilli* were all destroyed. About a drachm of the fluid was then injected subcutaneously into a sheep. A slight fever followed, which lasted a few days. In ten or twelve days, the animal was found to be "protected," and, when inoculated with fresh anthrax blood, was not in the least affected by it.

It may be observed of these two series of experiments, that they both tend to show a possible value for inoculation. But neither of them gives any strength to the bacterial theory of anthrax—the experiments of Toussaint, indeed, pointing directly against it. We may yet have to return to the view of Brauell, who discovered the *bacillus anthracis*, but refused to believe in its causative relation to anthrax.

STATE HELP FOR INVESTIGATIONS INTO THE CONTAGIOUS DISEASES OF ANIMALS.—Very striking inferences regarding the nature of *contagia vera* may be drawn from the experiments of Pasteur, Toussaint, and Greenfield, that have been just described. That is to say, we might draw such inferences if the experiments referred to were at all corroborated by others. There is great need that such confirmation be furnished, if possible. And if it is proved that the "vaccine" of the two contagious diseases already investigated can be obtained by artificial processes, there should be further experiments to extend the application to other diseases. It is very desirable that these and kindred questions in comparative pathology be taken up on this side of the Atlantic. We lack greatly the official aid which men and institutions abroad receive so generally. There could be no greater help given to science and the interests of live stock owners than by direct appropriations for scientific researches, or, better, by establishing some institution like the Brown Institute in London, where work in comparative pathology could be carried on systematically. It is unfortunate that comparative pathology, though capable of throwing so much light upon disease, offers no pecuniary reward to those who would like to study it. All the more it deserves the help of an enlightened State.

On the other hand, the vast and constantly increasing interests of live stock owners demand the wisest care from our legislators. The loss of property occasioned by diseases, contagious and otherwise, among animals, is immense, and deserves much more attention than it has ever yet received. If there are any methods by which these diseases can be prevented, cured, or stamped out, they should be known. Such methods can only be learned, however, by patient study and investigation—work which cannot be prosecuted without State help. This it should receive.

A NATIONAL CATTLE COMMISSION.—We give on another page the views expressed by Secretary Sherman in his last annual report, regarding the exportation of American cattle, and the creation of a National Cattle Commission. The facts are briefly these: England is afraid that certain contagious diseases may be carried by American cattle among its own herds. The Privy Council has therefore scheduled against all American cattle, sheep, and hogs brought to English ports. It compels their immediate inspection, the slaughter of all diseased animals at once, and the slaughter of all neat cattle within ten or twelve days after arrival. These regulations cause a loss to American stock dealers of from one-and-a-half to two-and-a-half millions of dollars a year. Now, the actual facts regarding the danger of contagion are, that scarcely any contagious diseases are exported from this country at all. No pleuro-pneumonia has, we are informed, ever been certainly found among American cattle landed in Liverpool. Out of 10,670 cattle, 5,960 sheep, and 2,237 hogs landed from the United States in that port, from June 2 to August 13, there were found but six cattle condemned as having pleuro-pneumonia and three condemned with the foot and mouth disease, ten sheep condemned with scab, and twenty-three hogs with swine fever.

With such statistics as these, it is natural to believe that if the English Government could have some official guaranty that American cattle were free from disease, they would remove their present restrictions against them. The Secretary of the Treasury, therefore, recommends the creation of a Cattle Commission. Its duties are to be to investigate reports of the existence of the various contagious diseases, and to collect information respecting them, reporting the results to some department for official publication. The commission should also be authorized to co-operate with State and municipal authorities, and persons or corporations engaged in the transportation of neat cattle, and to establish regulations regarding them. And, finally, such a commission should be authorized to establish quarantine stations, and to make regulations for such stations, if necessary.

The creation of such a commission would, we believe, be of the greatest value to the live stock interests of the country. The project was endorsed by the convention of live stock owners held at Chicago some time ago. It is greatly to be hoped that Congress will take the desired action in the matter.

TUBERCULOSIS AND EXPERIMENTS ON MURDERERS.—There have been established by repeated experiments a large number of facts regarding the infectiousness of tuberculosis. It is known that the disease may be communicated from man to lower animals, and from one of the lower animals to the other. The only point yet left undemonstrated is, whether the tuberculous virus from lower animals can, under any ordinary conditions, infect man. Yet this point is by far the most important one to be established. It is, indeed, the especial goal of all the work and study upon the subject. We have, on the one hand, the fact that one-fifth of all deaths are caused by pulmonary phthisis; with which disease tuberculosis has so close a connection, if not a nearly uniform identity. But besides this great mortality from consumption, there are thousands of deaths annually from tuberculous diseases of the intestines and meninges.

On the other hand there are three or four million head of cattle in the country. If tuberculous disease is as frequent here as in Germany, which we have reason to believe is the case, there must be a vast number of infected animals among our herds. Yet from them the people are being constantly supplied with milk and meat. The importance, therefore, of seeing that so immense a source of food-supply be a healthy one, is strikingly apparent.

We know of only one certain way by which the question whether man can be infected by the milk or flesh of tuberculous cattle can be settled. This is by making the experiment upon man himself—upon criminals condemned to death. There is nothing cruel or at all revolting in the idea. For a certain period previous to the day for execution, the person to be experimented on should be fed with the milk or flesh, or both, of tuberculous cattle. There need be nothing offensive in such a diet. The criminal's physical condition should be carefully watched to see whether tubercles develop. After execution, a careful necropsy should be held. By experiments properly conducted in this way we should secure results of the highest importance to science, and preventive medicine.

SANITARY CARE OF THE LOWER ANIMALS—We are glad to notice how rapidly the present popularity of sanitation and preventive medicine is extending among those who have the care of the lower animals. The erection of barns, stables, sheds and poultry houses, now often involves some other question than that of expense, or even of architectural beauty. A plea that fowls, and even swine, may have fresh air, sunlight, and exercise; that the places in which they are kept be made warm in winter and cool in summer, would once have appeared very extravagant. But it is as much economy as it is kindness to look out for the health of these animals and to put them under the best hygienic conditions. The same is true of every animal whose life has any economic importance. Under all ordinary circumstances, the surroundings which secure the most comfort to the animal, are the most economical to the owner. Even a Strasbourg goose must suffer no pain, or it will not fatten.

This appreciation of the value of sanitation, however, though increasing, is not as widely extended as it ought to be. The facts given by Professor Heath, in another part of the JOURNAL, abundantly show this. The condition of many stables in this city indicates that a very great amount of ignorance, inhumanity, and short-sightedness on the part of those who take care of live stock still exists.

HEAVY DRAUGHT BREEDING HORSES seem to be in greater demand in the United States than even before the days of railroads. During 1876 some three hundred were imported from Europe, and the prospect now is that even that number will be exceeded this year. These heavy horses are not popular in the Eastern cities, however; it is found that the most work can be gotten out of medium-sized animals. In cities, especially, large horses have to be used with great care, as any rapid driving over the paved streets is sure to injure the hoofs. Heavy draught horses cannot be used in cities until they are well matured.

VETERINARY EDUCATION IN ENGLAND cannot be in such a vastly superior condition to that in this city, if we may judge by the following quotation from an editorial in the *Veterinary*

Review. The editor says: "We cannot be accused of exaggeration when we venture to assert that scores of young men, very imperfectly educated—scarcely able to read and write their own language—who may have failed in other pursuits, and are without any idea of the requirements of a veterinary surgeon, have entered our schools, and in due time received their diploma without ever having given a dose of medicine, performed the slightest operation, or gained the slightest insight into the ordinary routine practice."

There is a very active discussion going on, in the same journal, as to whether the English veterinary students keep themselves as clean as they ought. This important matter has not yet been decided.

Such comment and discussion as the above cannot occur in the colleges of this city, at least. We should add, perhaps, that the Royal College of Veterinary Surgeons has recently resolved that no student shall receive a diploma without having had a year's pupilage.

THE JOURNAL OF COMPARATIVE MEDICINE enters its second volume under the best auspices. Help has been promised it, in the form of contributions and subscriptions, from various quarters, and there is no reason to doubt its success in the new field that has been chosen.

It will be the central object of the JOURNAL to discuss and contribute to the knowledge of the diseases of animals, especially of the horse.

It has been thought best to substitute the name JOURNAL for "ARCHIVES," since the former title better expresses the character and scope of the periodical. It will contain news and discussions, and will be something more than a mere repository. The necessity for such a change would be absolute, in case the JOURNAL should be more frequently issued.

REVIEWS.

HORSES' TEETH: A Treatise on their Mode of Development, Physiological Relations, Anatomy, Microscopical Character, Pathology, and Dentistry. Based on the Notes of well-known Odontologists and Veterinary Surgeons. To which is added a vocabulary of the medical and technical words used. By WILLIAM H. CLARKE. 16mo, pp. 262. New York: Published by the Author. Price, $1.50.

This book is a venture in the field of veterinary science which we hope to see more frequently imitated. The book is mainly a compilation, admirably arranged and prepared with great thoroughness of detail. The compiled matter is well edited and condensed, much of it being rewritten. The original matter is deserving of attention, and will, no doubt, be read with interest, as the author ascribes its parentage to C. D. Home, D. V. S. The work contains much besides the matter pertaining to horses' teeth, the teeth of many other animals being described and compared with those of the horse; in fact, the work might be very properly entitled Teeth, instead of "Horses' Teeth." It gives the history of the evolution of the horse from early geological periods, the half-teeth, which the author has named *Remnant Teeth*, they being traced back to the Eocene period, at which time they were functionally developed. This fact throws light on what has been a mystery, and the author appears to have made a discovery. There are eight chapters, devoted to the following topics, viz.: Tooth-germs—The Temporary Dentition—The Permanent Dentition—The Canine Teeth or Tushes—The Remnant Teeth—Dental Cysts and Supernumerary Teeth—Horses' Teeth under the Microscope—The Pathology of the Teeth—The Dentistry of the Teeth—Fractured Jaws—The Teeth as Indicators of Age—The Trigeminus of Fifth Pair of Nerves.

The work as a whole is very commendable, and we feel sure it will find a place in the library of all interested in a thoroughly practical as well as scientific knowledge of horses' teeth, and will be found exceedingly valuable both to the student and practitioner of Comparative Medical Science.

COMPEND OF ANATOMY. By JOHN B. ROBERTS, A. M., M. D., Lecturer on Anatomy, etc., Philadelphia School of Anatomy, etc. Philadelphia: C. C. Roberts & Co. 1880. 16mo, pp. 191.

This excellent little book is an abbreviation of our standard works on anatomy. It is designed for use in the dissecting room—for those who are preparing for examinations, and for hasty reference. It is well arranged; much of it is in tabular form, especially the portion devoted to the muscles and nerves. Many Latin names have been substituted by appropriate English names. In short, it is an anatomical brief admirably adapted to the purposes tor which it is designed.

THE BEEF BONANZA; OR, HOW TO GET RICH ON THE PLAINS. By Gen. JAMES S. BRISBIN, U. S. A. With eight illustrations. Philadelphia: J. B. Lippincott & Co. 1880. 16mo, pp. 222.

The author of the above work has certainly struck a fruitful theme, and one which cannot fail to interest the many who are anxious to learn ot the opportunities for wealth offered by the great West. The way to get rich on the Plains does not lie in following directions for hunting and trapping wild animals, but in taking advantage of our great grass-covered areas, by making the tegateska take the place of the tatonka—the tame steer graze over the stamping-ground of the wild buffalo.

The questions so often asked, "Where had I best to settle?" "Where can I buy the cheapest and best land?" "Where will I be safe?" "Where can I raise the best stock?" are in this little work clearly and intelligently answered. Of the various fields for settlement he says:

> "I believe Kansas and Iowa are the best unsettled farming States; Nebraska is the best State for farming and stock raising combined; Colorado is the best State for sheep growing, farming, and mining; Wyoming is the best Territory for cattle growing alone; Montana is the best Territory for cattle growing and mining."

Twelve years in the saddle, spent in traversing the most of the territory between the Missouri and Pacific Coast, have given Gen. Brisbin authority to say what he has to say upon the capacity of the great West for stock raising. He argues that it is no use for the young men of the present day in the East to bemoan the high price of land and the few chances of wealth at hand, when better and almost unbounded facilities are offered beyond the Missouri. "*Now* is the time; in a few decades is will be too late."

Under the heading "Cattle-growing out West" he gives a vigorous description of "The Land to the West of us—Great Lands and Great Owners—Estimated Fortunes—The Money to be Made—Millions in Beef," &c.

Under the head of "Sheep-Farming in The West," he describes The Raising ot Sheep—Where it is Done—The Wool Crop of the World—Sheep-

Walks of the Plains—A Fortune in Clip—How Ranches are Managed—Kind of Ranch to Select—Profits of Sheep-growing," &c.

"Horse-raising in the West" explains "Who the Horse-raisers are—How they Manage their Herds—Profits of Horse Raising under Favorable Conditions—Horse Notes," &c.

Our great natural grazing ground, he says, comprises 1,650,000 square miles, and here, along the banks of its lacework of streams, are located the great beef bonanza of the present and future.

Numerical totals give but a small and faint idea of future possibilities in the raising of cattle, sheep, and horses, as well as dairying, to which the West invites us. The number of people is increasing faster than the number of cattle. Thus the sure home market is growing, while the whole world without clamors for cheap beef and mutton. "For ten years at least yet, the stock growers need have no fear of overstocking the beef market."

From the general to the particular the author goes with the bent of a practised mind, giving faithful pictures of life on the ranches and ranges, and clear calculations of the profits to be made. The latter he bases on the actual experience of the settlers.

He is enthusiastic in his beliefs, lively in his descriptions, but cautious in his estimates; so much so that one is scarcely aware what a purely commercial book he is reading until he pauses to think how much he has read in other books about the Plains without getting any practical information. More than ever, in his belief, wealth, freedom and growth are the rewards of well-applied industry in the great West, and he blesses Horace Greeley in his grave for the advice he gave so often, "Go West, young man, go West."

CASE DEPARTMENT.

I.—A CASE OF ŒDEMA GLOTTIDIS FOLLOWING THE "EPIZOOTIC" CATARRH.

A GREY gelding, æt. fourteen; had coughed for eighteen months prior to death. At frequent intervals during the past eighteen months the horse was noticed coughing up frothy mucus tinged with blood; the cough at other times was dry. These attacks of coughing up bloody sputa always followed severe exercise. The horse had nearly recovered from the "epizoot," and had been able to work up to two days before his death. Two days before death there was an increased frothy discharge from the nostrils, accompanied by cough and hiccoughing. This cough and discharge from the nose gradually increased. The discharge from the nostrils grew thicker and of a yellow coler, but at no time contained any blood. There was some increased heat around the throat, but no marked external swelling. On physical examination, sharp, crackling râles were detected, indicating an œdematous condition of the lungs. The respirations were twenty-eight to the minute. The limbs were cold to the hand, also the whole length of the trachea; urine, so far as noticed, normal; bowels regular. For the last day the horse could not be got to eat. The horse dropped dead in the night. A necropsy was made by Dr. Porter some twelve hours after death. Rigor mortis was well marked; animal in fair flesh. Thoracic cavity:—The pericardial sac contained considerable more fluid than normal. The heart was enlarged and the left ventricle hypertrophied. There was a marked thickening and fatty change both in the ventral and aortic valves, both being insufficient; the lesion being most marked in the ventral. The base of each lung was deeply congested and in a condition known as "splenization." The upper lobes were somewhat congested and œdematous; as a result of this condition, the breathing space was greatly diminished. The lower part of the trachea and bronchia was filled with frothy mucus. The trachea and larynx were both laid open throughout their whole extent. When the upper end of the trachea was reached it was found deeply congested and covered by numerous ecchymotic spots; in the larynx the congestion and echymosis was even more marked, with marked œdema of the aryteno-epiglotidian folds, indicating the condition known as œdema glottis. In the abdominal cavity all the organs appeared normal. The cause of death was undoubtedly œdema glottidis complicated by chronic heart and lung disease.

This case presents points of interest which have not been as fully appreciated as they ought to be. The subject of œdema glottidis and the rapidity with which it produces death, can never be too frequently called to mind. It is a well-known fact, however, that the condition known as œdema glottidis is absolutely incompatible with life. Had tracheotomy been performed the night before, this horse would in all probability have been alive to-day. As there is no special objection to the operation, it ought in veterinary practice to be resorted to early in all cases of severe laryngeal disease. By the early performance of tracheotomy many a valuable horse could be saved. The cardiac lesions are also of great interest, this case proving conclusively that cardiac murmurs, indicating cardiac disease, do occur in horses as well as in human beings. Although these lesions were not detected before death, there is no doubt that they might have been recognized then. But physical diagnosis is another subject that is neglected in veterinary medicine. Had this condition of valvular insufficiency been detected, there is reason to believe that, by a careful administration of remedies, œdema glottidis might have been warded off. From the simple fact that the air space was diminished and the demand for air greater than normal, there was of necessity increased irritation of the laryngeal mucus membrane, and with an impeded blood current, everything was favorable to the development of œdema glottidis.

William Henry Porter, M. D., and William Soula.

II.—A CASE OF CHRONIC DIFFUSE NEPHRITIS.

The previous history is somewhat imperfect, as it was obtained from the coachman. It is as follows: The horse was driven from New York City, on Saturday July 3d, to the town of Roslin, a distance of seventeen miles, and fifteen miles from this place (Huntington). When leaving New York City the animal was in apparent health, but when on the road Saturday, was caught in a heavy shower. On Sunday morning the animal appeared a little unwell, but not enough so to excite any fear on the part of the coachman. The time occupied in driving from Roslin to Huntington was four hours, a slow rate of speed. It may be well to state that the horse was one of a pair, that were attached to a light road wagon, the load two men, so that the work performed by the animal during those two days was of the mildest type. When near Huntington, the horse began to stagger, principally from weakness of the posterior extremities. This was speedily followed by general weakness, and the coachman thought he had an attack of "blind staggers" or vertigo. The coachman said "his left eye went back in his head so far that he thought it would never return." As soon as the horse was stabled, he seemed to partially recover. A few hours after, or at four o'clock P. M., a second attack developed with the following symptoms: Constant pawing with the left forward foot, a constant attempt to rub the loins with his nose, and if let loose upon the open floor would walk round in a ring, always turning to the left. If turned to the right, he would instantly turn to the left when let loose. At nine o'clock P. M. I saw the horse for the first time; he was then standing in his stall, constantly pawing with his left forward foot; was very excitable; eyes prominent and glassy; showed great weakness in his posterior extremities; pulse full and beating 80 to the minute; temperature 104⅛°F.; rectum empty; no apparent desire to micturate, and the coachman informed me that he had not passed water, to his knowledge, since he left New York. The owner informed me that he had always been troubled with his kidneys. I diagnosticated uræmic poisoning from renal disease. As the urine could not be obtained, an exact diagnosis of the lesion could not be made. Ordered a brisk cathartic: Aloes Barbadoes 8 drachms, combined with Hydraryg chloride mite 2 drachms, in one ball; took a small quantity of blood. The pulse grew a little stronger; applied warm fomentations to the loins; administered a warm water enema; gave spiritus etheris nitrosi, 2 ounces, in water, as a stimulant and diuretic. The horse died the next morning, at eight o'clock, a little less than twenty-four hours after the exposure to the heavy rain. At the post-mortem, the lungs, heart, liver, spleen, and intestines appeared to be perfectly normal; the kidneys were surrounded by a thick fatty capsule, but the kidney substance was very easily torn or broken when handled. A microscopical examination of the kidneys was made by Drs. Satterthwaite and Porter, at the School of Histology in connection with the Columbia Veterinary College. On dissection, the kidneys were deeply congested. The epithelium in some of the uriniferous tubules was perfectly normal, but in most of the tubules the epithelium was found to be in an advanced state of granular and fatty degeneration. In some of the tubes there were no epithilia, and the tubes were filled with hyaline and fatty masses, probably casts. In some places, where the epithelium was completely destroyed, the walls of the tubes were collapsed and appeared as fibrous cords; there was also some increase in the interstitial tissue. The lesion of the kidney was that of chronic diffuse nephritis, and confirms the diagnosis.

J. LINDSAY, D. V. S.,
Huntington L. I.

NOTES BY W. H. PORTER.—This case presents some points of interest in comparative medicine. This is still another case in veterinary practice which proves quite conclusively that renal disease is a common disease among horses. It also shows that exposing the animal, and especially the loins, to wet and cold, tends to excite exacerbations, if not to produce renal disease. The microscopical examination showed that the diagnosis had been correctly made, and if the urine had been previously carefully examined, the exact form of kidney lesion might have been predicted. It proves conclusively that a careful chemical and microscopic examination should be made more extensively in veterinary practice. In this case, however, Dr. Lindsay had no chance of procuring any of the urine for examination; but had the horse been seen earlier, and a diagnosis properly made, the life of the animal might have been prolonged.

This case, in connection with two cases reported in the last number of this Journal, by Mr. William Soula, is still stronger proof that partial posterior paralysis is a condition referable to the kidney as the exciting cause.

III.—A CASE OF ACUTE CONGESTION OF THE KIDNEY IN A GRAY GELDING, COMPLICATED WITH PARALYSIS IN THE HIND EXTREMITIES.

Dear Sir—Thinking that the following case may prove interesting to many of the readers of the Journal, I am induced to forward it for insertion. The subject of this communication is a powerful gray gelding, five years old, and about fifteen cwt. (1500), the property of Matthew White, Esq., malster, foot of Bethune street, this city.

History.—On the morning of February 27th, 1880, at 7 A. M., the horse left stable in Bethune street to all appearances in the best of health; when he got as far as Market street he lost all power in posterior extremities, and went down. The driver and others used all means at their command to raise him, but to no purpose. About 9:30 A. M., same day, at the request of owner, I was called. When I arrived at Market street, found my case lying on left side, unable to get up. I called a few assistants, had him turned over on right side, but with no better results. The weather being frosty, with some snow on the ground, I ordered blankets and straw placed around him, and alcoholic stimulants in the shape of Irish whiskey one pint, and water eight ounces. I next sent for Mr. H. Bergh's van, which arrived about 2 P. M. I must here commend and thank the ambulance aids for their prompt appearance and their careful manner in handling the poor dumb creature. On arriving at my Infirmary, had horse removed from ambulance and placed in a large, well-ventilated box-stall, 10 x 12 feet; gave alcoholic stimulants freely, followed with

Linseed oil, ...	1 pint,
Barbadoes aloes, ...	3 drachms,
Pulv. ginger, ...	2 drachms.

Used friction and liniments over loins and extremities; gave nux vomica in powder 2 drachms, ginger and gentian a. a. 2 drachms in bolus. Next had my patient placed in slings, then gave enema—soap-suds six quarts, oil of turpentine 2 ounces. Next, by the means of catheter, removed about two quarts of dark-colored urine, tinged with blood and slightly albuminous. 6 P. M., my patient very weak; pulse quick and small, almost imperceptible. Gave

Extract digitalis, ...	15 grains,
Carbonate ammonia, ...	2 drachms,
Cinchona, in powder, ...	1 drachm,
Ginger, in powder, ...	1 drachm,

in bolus; left linseed tea for drink, and gave four quarts of bran mash; ordered flannel bandages on all fore extremities, and left him in charge of night watchman. February 28th, at 7 A. M., found patient much better; pulse 45 per minute, extremities warm, patient somewhat firmer on his limbs. Gave nux vomica, in powder, 2 drachms; sulphate of iron half drachm, in bolus, every six hours, followed with whiskey four ounces and water 4 ounces, twice a day.

February 29th.—Same treatment continued. Gave oatmeal gruel in bran mash. March 1st, 8:30 A. M., pulse normal, but bowels very active. Discontinued the use of linseed tea; wheaten flour, half-pound in a pail of chilled water, substituted.

Treatment about the same until March 5th. Patient continuing to improve, I stopped the use of nux vomica, and gave in place of it—

R.—Extract digitalis, ...	10 grains,
Sulphate iron, ...	½ drachm,
Iodidi potassii, ...	½ drachm,
Gentian et ginger, ...	a. a. ⅓ drachm,

in bolus, one daily for five days. His diet consisted of ground malt and bran mash, with hay sparingly.

March 15th.—Patient doing well. Removed him from slings in daytime, but had him put back at night. Continued the use of tonics and stimulants each daily, till March 25th, when I removed my patient from slings for good. He was then able to get up and down himself. All medical agents were suspended; gave nutritious diet, walking exercise, etc., etc.

April 2d.—Patient discharged. Went to work about April 10th, and has worked and done well ever since. J. Cuff, D. V. S.

IV.—SCIRRHOUS CARCINOMA IN A COW.

At a recent meeting of the Pathological Society of New York, Dr. Satterthwaite presented a specimen of scirrhous cancer from a cow. The history, furnished by J. Lindsay, D. V. S., of Huntington, Long Island, was as follows:

In January last a cow, six years old, and in excellent condition, received a blow on the side of the cheek. In April following a tumor was first detected at the spot where the injury had been received. It grew; the adjacent lymphatic glands became involved, and also the eye. In June there was a discharge from the growth and its extension became more rapid. Finally, as there was no amelioration in the symptoms, the animal was killed by advice of Dr. Lindsay, who diagnosticated carcinoma, and gave an unfavorable prognosis.'

The tumor, when removed, was found to measure fourteen inches in its greatest circumference and five inches in diameter, with a maximum thickness of two inches. It was surrounded by a slight fibrous capsule, something of a rarity in these malignant neoplasms. On dissection, it exhibited the peculiarly white and glistening cords that belong to scirrhous, and it had the same creaking feel when cut into by the knife. Altogether the microscopic appearances were such as are commonly seen in scirrhous carcinoma of the female (human) breast.

The microscopic evidences of this particular variety of carcinoma were most satisfactory.

V.—A CASE OF FIBRINOUS PERICARDITIS IN THE HORSE, WITH ENORMOUS EFFUSION, ASSOCIATED WITH PURPURA HEMORRHAGICA, AND FOLLOWING THE "EPIZOOTIC" CATARRH.

The following case was under the charge of Dr. F. V. Walton, veterinary surgeon, for the first few days prior to admission to the Columbia Veterinary College Hospital, where the case came directly under the care of N. F. Thompson, D. V. S.

The post-mortem was worked up by Drs. T. E. Satterthwaite and W. H. Porter, and the heart, with pericardial sac, both of which were covered with a most exuberant growth of sillosities, constituting the condition known as "hairy heart," and presented at the Pathological Society of New York. Gray mare, aged eighteen years, weighing about 1,200 lbs., was first seen October 11, 1880. She then had marked œdema of both hind extremities, and slight œdema of the fore ones. She had previously suffered from the "epizootic," though mildly, and it was thought she had recovered. The visible mucous membranes at this first inspection were very much congested, and marked by numerous blotches, indicating extravasations of blood. Temperature, 102.4° F.; pulse 44; respiration, 15. The animal was now eating well, and the bowels were regular. The symptoms, however, did not improve, and hemorrhagic spots were soon found on the inner sides of the thighs and under the skin in other parts. The diagnosis of *purpura hemorrhagica* had been made.

When next seen the temperature had risen to 104° F., and the pulse had fallen to 42; respiration 15. The general condition had not improved, and there was a serous oozing from some collections of œdema on the extremities.

On October 15th the mare was found to be failing. The œdema had mounted to the body, and was apparent on the nose, where the characteristic line of demarcation between the serous collections and uninvaded tissue was well seen and sharply defined, as is usual in purpura. The respiration was now 25, and much embarrassed, owing to the external swelling. Temperature was 106° F., pulse 50. The animal was greatly depressed and debilitated. On October 16th, the swelling of the head had become so great that it was almost impossible for the respirations to be carried on. Accordingly, tracheotomy was performed (10 A.M.) by Dr. N. F. Thompson, veterinary surgeon. The asphyxiated condition was at once relieved, and respiration became almost normal in frequency. The appetite also returned. Digitalis was now administered, to control the heart and remove the œdema.

On October 20th, this object appeared to have been accomplished quite satisfactorily, so on that day the tracheotomy tube was removed. The condition of the animal seemed to be fairly good, though there was great exudation of serum from the posterior extremities, and some ulceration and even sloughing of the skin. This latter unfortunate condition progressed so that the lower part of the extremities were simply covered with ulcerations. At this time the urine was examined, but though it contained the carbonate and phosphate of lime in abundance, together with some pus, there was no more albumen than would be accounted for by the latter.

The pulse now became very rapid and feeble (80), but the mare continued eating and walking about. Suddenly, at 11 P.M., she fell, and was found to have instantly died. A post-mortem examination was subsequently made by Messrs. Wallace and Frey, students of veterinary medicine.

On removing the sternum, the pericardium was found firmly attached to it and to the sternal end of the ribs on the right side, leading at first to the erroneous supposition that it was a case of pleuritic adhesion.

Upon cutting into the pericardial sac, it was found to contain an enormous quantity of slightly turbid serous fluid, ranging from nine to twelve gallons. This distended sac had displaced and compressed the right lung much more than the left. The whole inner surface of the pericardium was covered with a thick layer of villous projections on both visceral and parietal surfaces. To the naked eye the heart looked much like an enormous sponge that had been soaked in water. The layers of fibrinous material were neither very thick nor very firmly attached, which would imply that the disease had not existed a long time. The weight of heart, with its contained coagula and the pericardium, was nineteen pounds—an excess of ten pounds over the weight of a normal empty heart. Under the microscope, the villosities were found to be partially organized, and contained an abundance of crystals of a brown color, either in rhombic plates or in needles, which latter were often arranged in stellate fashion. The rhombs were regarded as hæmoglobine crystals, and the imperfect rosettes as hæmatoidine. The *lungs* were normal, except for œdema and hypostatic congestion. Beneath the mucous membrane of the *stomach*, as well as in other organs, there were numerous hemorrhagic spots. The *spleen* was soft; so also were the *liver* and *kidneys*. These latter were almost diffluent, and on microscopic examination exhibited very granular epithelia, indicating parenchymatous difficulty, such as is met with in all diseases where the blood is profoundly infected.

Dr. Satterthwaite observed that, *apropos* of the connection between epidemic diseases of the lower animals and man—a subject that was now attracting much attention—it was well to know that this disease was thought to be closely allied to another disease in the horse, known as *scarlatina*. Indeed, several eminent English veterinary surgeons had thought it impossible always to distinguish between the two. Others, again, had regarded it as a carbuncular disease of the anthrax or charbon family. Since Copland, according to Williams—one of the most recent systematic writers on veterinary medicine—had stated that scarlatina originated in the horse, and had been communicated from him to man and other animals, the disease was worth some attention. It could not be said, however, that there was any marked parallelism between scarlatina in the horse and man.

Still, if we accept the description given by Williams, it would be observed that the petechial eruption, which latter is confluent, corresponds to the human type; then, œdema is common to both, and so are sloughing of the skin, rheumatism, heart complications, and extravasations of blood. The œdema, however, is not thought to be renal, and the disease is intermittent, or, rather, remittent, in character, having curious exacerbations. It is also thought to be non-contagious.

This particular disease was *purpura*, and it exhibited the characteristic appearances that have been described. Fibrinous pericarditis was thought to have been excited by the general blood disease.

In answer to a question, Dr. Linntard stated that purpura hemorrhagica was a common sequillan of the epizootic, and occurred generally as an evidence of a broken-down condition in horses that were kept at work during the progress of the disease. The purpura was the direct cause of death in a large proportion of those cases.

VI.—PHTHISIS IN A MONKEY (*Macacus pileatus*),

CENTRAL PARK MENAGERIE.

Necropsy.—The body was somewhat emaciated. Other external peculiarities were not marked. The abdominal cavity contained no fluid; the bladder was distended with clear urine; the spleen was greatly enlarged, and contained many large variously-shaped cavities, showing separate membranes, and filled with creamy or cheesy masses. Stomach, liver, and intestines presented no abnormality. Both kidneys were large, had non-adherent capsules, but showed numerous small yellowish or grey spots disseminated through their substance. On opening the thorax, the left lung was found to be healthy, but on the right side there was no remnant of normal pulmonary tissue. The entire pleural cavity of that side was filled up with a cheesy, crumbling mass, which adhered to the pericardium and had encroached on the heart. In this yellow substance rounded or oval encapsulated accumulations, of a firmer consistence than the surrounding cheesy mass, were discovered. Two of these—one about the size of a cherry, the other as large as a pea—were firmly attached to the costal pleura. The substernal and bronchial glands were likewise in a condition of uniform cheesy degeneration. The heart showed moderate hypertrophy, especially of its left ventricle. On opening the skull, the dura mater was seen to be somewhat thickened, principally at the convexity. The pia mater showed numerous variously sized ecchymoses, but was not opaque or thickened. The brain itself appeared normal. E. C. W.

* * *

CORRESPONDENCE.

A CASE OF MENINGITIS IN THE ELEPHANT—POST-MORTEM.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:—

I SEND you a history of the following case, which seems to be unique:

The African elephant at the St. Louis Zoological Garden (Department of the St. Louis Agricultural and Mechanical Association), not long after his removal into winter quarters, began to exhibit a capricious appetite, which gave the keeper much anxiety, as in the course of a week or so he showed an indifference towards his grain feed (oats and Indian corn), as well as the bran; he finally refused grain, at the same time gradually falling away in flesh. Timothy and clover hay formed his chief diet during the last three weeks of his life. Corn, cooked and raw alike, was rejected; potatoes and turnips were at first eaten, but soon refused; apples were most acceptable, but, as may be supposed, he was not greatly indulged in that diet. The gradual but constantly increasing emaciation indicated serious disorder of some nature, though what it might be was not apparent. To improve the appetite, small doses of potassium iodide had been given for some three weeks before, and then discontinued, with expectation of readministration.

The evacuations were normal, the eye bright, the bodily movements natural, the condition of the skin as good as at any previous time. The only symptom, apart from the loss of appetite, that might be regarded as a token of sickness, was the occasional resting of his head against the wall; but it is said that, in the wild state, elephants sometimes sleep in that position. Another symptom was a peculiar spasmodic jerking of the abdomen that took place once in a while, without apparent cause. This, however, was slight, and only to be observed on close inspection; besides, it was a trick of old standing. The keeper thought he had become rather more vicious, showing a disposition to rush at him without provocation. Balls had been put upon his tusks last spring, to prevent damage to walls and fences. Still, there was nothing definite to suggest the actual outcome of his sickness, and neither the keeper nor myself suspected the brain to be the main seat of disorder. I prescribed an aloes purgative, combined with ginger and molasses, thinking that free evacuation of the bowels might improve the appetite, and relieve a probable dyspeptic condition. Human beings are apt to be not over good-natured when they have a poor digestion. The dose was such as is given the largest horse, and acted in twenty-four hours moderately, but moved the bowels sufficiently without causing diarrhœa. He seemed decidedly better; ate more freely and acted more naturally for several days, when, without any warning, he was seized at noon with a frenzy, broke loose from his fastenings, and charged about the carnivora-house, in which was his enclosure, with an unprecedented outbreak of anger. trumpeting and roaring, and raking the floor with his tusks. The assistant keeper fled for his life into a convenient closet, while the regular attendant manfully .stuck by; but, expecting that the furious beast would break through the protecting railing, and set loose some of the carnivora that were already greatly excited, he opened the outer door, through which the elephant rushed into the open. In the park, he was temporarily held by winding a chain still attached to a hind leg about convenient trees, as he paused in the intervals of his madness. Towards evening he was coaxed, while partly quieted, into a log stable, and there fastened in. He then laid down, and about midnight died without more disturbance.

A post-mortem was made, with the aid of a number of assistants. The liver was the only abdominal organ that appeared diseased. This had undergone a fibrous degeneration (cirrhous?), much of the proper liver substance having disappeared. The stomach and bowels were filled with well masticated and digested food. The lungs were adherent to the chest walls, showing an old and extensive pleurisy. Heart normal. The chief disorder lay in the head. The membrane next the brain (the pia mater), on the upper surface of the brain, was much thickened, owing to a chronic inflammation, and one evidently of quite long standing, as the vessels passing into the pia resisted considerable traction. The brain substance, upon raising the pia, tore away with it. The vessels of the meninges were much congested, which state explained the sudden attack of madness. There was also some congestion of the lungs and liver, but this was a secondary matter.

It was fortunate that the elephant had been weakened by sickness, or in his frenzy much mischief might have been done. The animal was about two-thirds grown.

CHARLES A. TODD, M.D.,

Medical Director Zoological Department.

ST. LOUIS, Dec 17, 1880.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:—

On the night of November 25, a pack of dogs entered the park, and killed fourteen black swans, together with other water fowl. These raids by dogs are of frequent occurrence, and it is almost impossible to guard against them. When the deer were enclosed in the upper part of the park, the annoyance from these marauders was very great. Their plan of operation was, usually, to have a small dog creep through the wire fence, start the deer, which, when frightened, would either jump over the fence, or, by dashing against it, break a panel, escape, and become victims to the larger dogs awaiting outside. In these raids, the dogs seem to kill for mischief clearly, as they never eat the flesh. Dr. Hadden, in his article on the castration of the dog, for the protection of sheep and smaller animals and fowl, published in the second number of the ARCHIVES, gives very forcible arguments in favor of legislation in this matter, and the recent destruction of valuable fowl is an additional argument, proving the necessity of adopting some such measure of protection; and I will here confirm what he has set forth in his paper, that the male canine are the only offenders, and that they are always in company, or packs, in these raids.

W. A. CONKLIN,

Director C. P. Menagerie.

NEW YORK, Dec. 14, 1880.

PROGRESS OF VETERINARY SCIENCE.

The Standard Ration for Horses, recommended by Dr. Wolff, of Hohenheim, as the result of a series of careful experiments, is as follows:

PER 1,000 LBS LIVE WEIGHT.

	Total dry matter.	Digestible.			Nutritive ratio.
		Albuminoids.	Carbo-Hydrates.	Fat.	
	lbs.	*lbs.*	*lbs.*	*lbs.*	
Light work.	21.0	1.5	9.1	0.3	6.5
Ordinary work	22.5	1.8	11.2	0 6	7 0
Heavy work.	25 5	2.8	13.4	0.8	5.5

Spurious Pregnancy in the Lower Animals.—The Rev. Dr. Haughton relates a singular case of spurious pregnancy in an ass. The animal was placed with a zebra, by which it was, during heat, frequently covered. After this connection, the abdomen of the animal began to enlarge, the mammary glands to harden and increase in size. There was no further return of heat. The animal was believed by all to be pregnant. At the end of eleven months, however, which is the regular duration of its pregnancy, the enlargement quite rapidly disappeared, and the animal returned to its normal size and condition. The ass was put with the zebra again, and the same result followed.

Dr. Haughton thought that there might be some psychological element in producing this spurious pregnancy. The lower animals had not, he thought, been credited with the intelligence which was their due, and sexual passion and instinct were in many very strong.

The Gastrodiscus Sonsinoii (Cobbold)—A New Parasite of the Horse.—Equine parasites belonging to the order of trematoda are quite rare. The gastrodiscus is homologous to the *amphistomum conicum*, found in the digestive organs of cattle and much less dangerous than the former. The gastrodiscus was discovered about 1876, in a horse, in Egypt, by an Italian veterinarian practising at Cairo. This gentleman, a Dr. Sonsino, sent specimens of the worm to Cobbold, of London, and Leuckart, of Leipsig. By these helminthologists the worm was found to belong to an entirely new species, of the order trematoda and the group of amphistomum. The worm received the name of *gastrodiscus* (Leuckart), or *gastrodiscus sonsinoii* (Cobbold). The parasite had a rounded, disc-like form. Its ventral surface was concave, and was covered by hundreds of little sucking papillæ. The dorsal surface was smooth and bulging. Anteriorly a buccal sucking apparatus was found at the end of a small cylindrical neck. At the opposite end a second, much larger, sucking apparatus was seen. The latter occupied the dorsal aspect.

This parasite has again been found in the body of a mule, that died so rapidly as to suggest the probability of poisoning. Two other animals had died before it. Countless worms, representing the parasite under consideration, were found to line the mucous membrane of the alimentary canal, from the pharynx to the anus. M. Poirier and M. Mégnin examined the worms carefully, and were thus able to somewhat modify and correct the description given by Cobbold.—*Gaz. Méd. de Paris*, quoted in *Annales de Méd. Vétér.*, October, 1880.

Experiments in Horse Feeding.—A singular experiment is at present under trial in the French army. The Minister of War, anxious to reduce the bulk of provisions to be carried during a campaign, has ordered that a new kind of biscuit should be used as food for the horses. On the conclusion of the present manœuvres this food will be rigidly tested. Two squads of cavalry and a battery of artillery will at once be put under the new system. The circular of the Minister directs all the details, and orders that a commission composed of four officers and a veterinary surgeon should see that the instructions are completely carried out, and report on their progress and results. The selected horses are to be weighed and measured across the shoulders before the experiment commences, and two other squadrons of cavalry and a battery of artillery are to be selected, composed as nearly as can be of animals of the same weight and size. They are to be placed under allowance of fodder, and both at once to be subjected to the estimate averages of a campaign during twelve days. The experiment will be followed out, while the officers charged with its conduct will constantly report on its result. The horses are to be supplied with new food on the first day of the campaign, without any transition or preparation for the change. The biscuits are to be watered before each meal.

Cows Remaining in Heat.—Sometimes it happens that cows continue in heat for weeks, or even months, although, meanwhile, they may have taken the bull a number of times. In rare cases, the heat continues even though impregnation has taken place; but generally the cow will not breed. Animals in this condition are a great annoyance. The best plan is to give them a cathartic after a day's fast; then turn them out with a bull, and keep them on a low diet, with large doses of bromide of potassium.

MALIGNANT PUSTULE AND THE ŒDEMA OF ANTHRAX.—M. Colin, of Alfort (*Annales de Médecine Vétér.*, Sept., 1880), has recently undertaken an experimental analysis of the various forms and degrees of virulence of anthrax. He found that certain animals would not, after inoculation with the virus taken from the human being, develop the malignant pustule as observed in man. On the other hand, certain other animals showed different degrees of infection, and exhibited the disease in various distinctly characterized forms. If the blood of an infected being was inoculated into the skin of animals not apt to contract anthrax, the following different results were at various times obtained:

1. A simple half-closed opening, which, for several days, enclosed the virulent substance.
2. Diffuse erythema of short duration, disappearing quite suddenly.
3. Simple malignant pustule, projecting more or less. It was always red, umbilicated, and at first showed a serous discharge, which later became sero-purulent.
4. Simple œdema, without further cutaneous change.
5. Pustule followed by œdema.
6. Œdema followed by a pustule.
7. Pustule and œdema simultaneously developed.
8. Pustule with erythema and œdema.
9. A phlegmonous tumor.
10. Simple bubo, with lymphangitis of adjoining tissue.

The dog dees not readily acquire these various manifestations of successful inoculation, and here they usually have a benign character; whereas, in the human being, the affection is commonly of the malignant type. Never-the less, the dog's pustule shows its virulent properties when some of its secretion is tried on other animals. The mortality of the dogs was greatest in young subjects. Altogether, 23 dogs died out of 153 experimented upon. Of course, no treatment was resorted to. The mortality, therefore, only reached 14 per cent. In 91 animals, no appreciable effects resulted from the inoculation.

THE LATEST THEORY REGARDING THE CAUSE OF ABORTION IN COWS.—The latest theory in regard to abortion in cows is that put forth by Mr. Clark, of Battle Creek, Mich., in his work, recently published, entitled "Cattle Problems Made Clear." He does not consider abortion a disease in the ordinary sense of the term, but the "result of serious structural derangement in the size and the use of the mammary arteries—those that lead to the milk glands—the derangement resulting from the engorgement and relaxation of those arteries which, on account of their extremely enlarged size, convey so much of the mammary blood to the udder, that not enough is left to increase the necessary supply to the placenta, or continue the growth of the embryo; hence its death from deficiency of nourishment, and its expulsion a necessity to save the cow." He argues that milking pregnant cows too late, is antagonistic to their breeding power, and that a large yield of milk during pregnancy tends to dwarf embryo growth. Cows whose large capacity for yielding milk has been developed *gradually*, through many generations it would seem, on the hypothesis of Mr. Clark, would not be as liable to abort as common or ordinary cows that had been put through a forcing system; for in the latter case the increase of milk has been developed too rapidly. Hence, in the language of Mr. Clark, "abortion results from engorgement of the arteries that supply the udder glands with blood, the too great and rapid increase of blood being the result of equally great and rapid increase in the *feed* of the cows, whose arteries are consequently engorged, and their udders similarly filled and engorged with milk formed from a sudden increase in the quantity of arterial blood supplied to the milk glands." Mr. Clark treats the subject at considerable length in his book, and suggests means for the prevention of abortion upon this view of its cause.

RICKETTY EGGS.—It occasionally happens that hens will persist in laying thin-shelled eggs. The trouble has naturally been ascribed to a deficiency in lime salts, and the fowls are supplied with oyster shells, crushed bones, lime, ashes, etc. But these things very often do no good whatever, while, on the other hand, a careful attention to food, air, exercise, and sunlight will bring about a cure. This fact will be received with much satisfaction by those who do not believe in the prevalent theories regarding the pathology and therapeutics of rickets.

SCURFY LEGS IN FOWLS.—During the moulting season the legs undergo the same process of change, and a new skin grows, which, if the legs be without scruf, will appear bright and fresh like a chick's. There is nothing more unsightly than scurfy legs. This is in part hereditary, and in part brought on by filth. None but white and yellow-legged birds are affected with it to any extent. Although scurfy legs may be cured by the use of carbolic soap and an ointment prepared of lard and sulphur, it is better, if possible, to avoid the trouble by breeding and careful cleanliness. To shun bumble-footedness and bunchy toes, or lumps on the web, train the birds to low roosting poles, and keep their walks comparatively clean.—*Country Gentleman.*

BUMBLE-FOOT.—Most of the ailments that appear in the feet of fowls may be traced to some local cause. Bumble-foot and scurfy legs are not uncommon. The health and profit of the fowls thus afflicted may not be injured by these unsightly diseases, but it is better to preserve clean shanks and perfect feet. Bumble-foot is caused by a large bunch gathering on the sole or heel of the foot, which may or may not suppurate and disappear in the course of time. Oftener it turns into a hard callus, which contains no pus, and should be left alone. The origin of this difficulty is a bruise, caused by alighting from high perches, or sudden landing from high flights. It is seen mostly in large or heavy birds. It is rare in the small breeds. The best way is to prevent the trouble by proper arrangement of the roosting poles. Round perches are preferable to flat or square strips. The poles should be small—for a full-grown fowl not more than an inch and a half in diameter. A large fowl will roost on a small branch. One that is sufficiently large to bear the weight is all that is necessary. When roosting on a tree, fowls generally seek the outer branches, that are small and easy to clasp the toes around. Square or large perches cause crooked breast-bones, produced when young while the bone is yet gristly.

Where many fowls roost in a building, there cannot be allowed much vacant space. Where this is the case, have the poles small, but place frequent supports underneath to bear the weight, and be sure they are firm and reliable. Bumble-foot is often contracted from perching on a flat pole, where the toes must be extended, and the whole weight comes on the ball of the foot. The position is unnatural and uncomfortable. A little care in this respect will avoid many unsightly bunches on the feet.—*Country Gentleman.*

FOWL CHOLERA IN THE WEST.—Dr. Horne, in a letter to the *Cultivator and Country Gentleman*, says, regarding fowl cholera:

"I have received many letters of inquiry respecting the treatment of this formidable disease. Many persons write, saying that they have lost all their fowls, of mixed kinds, and with various roosting places. Those well housed suffered about the same as those which improvised a roosting place on trees, sheds, fences, etc. Carefully studying all the conditions as I have received them lately, there would appear to be none which seemed to be of any benefit to poultry. Some of the best regulated yards seem to have suffered quite as much as any. I have visited some of the best, and found the ravages of the disease to be as bad as I found anywhere. Not only do methods of housing make little or no difference, but I find that food also seems of little influence. I found the death rate as great where mixed food was systematically given as I did where only one general food was given. I found no more losses where moderately confined than I did where the fowls had an unlimited range of a whole farm.

"I found that all sorts of medicines had been given, according to the belief or fancy of the person in charge. All seemed to be useless, and the disease is on the increase here in the Northwest. Well, what are we to do?

I hardly know myself; but as my yards are so far unaffected, while the disease is all around me, there must be something in my management. I give plenty of air, keep clean, and feed half a dozen kinds of food. I keep all the places where the droppings can fall constantly disinfected with kerosene. I sprinkle all the places each time I clean them out (twice a week). As soon as I see the slightest drooping or discoloring of the comb, I wash in kerosene and give them five drops of tincture of nux vomica in half a teaspoonful of water. All the water they drink should be impregnated with iron. I give mine in an old rusty ash drawer from an old coal stove, which answers well."

DYSPEPSIA IN PIGS.—When pigs are affected with indigestion, salt and charcoal will be found a remedy. Mix the salt and charcoal together, putting them in a box accessible to the pigs; they will eat no more than required.

MILK SICKNESS, OR TREMBLES.—A cow affected with milk sickness will communicate the disease, through her milk, to her calf; the calf dying, will give the disease to hogs eating the dead calf; dogs eating dead hogs will die of the disease. It is a disease that reproduces the cause in the animals affected. This would be rather against the theory of mineral poison. Impure drinking water may cause it.—*Cor. Phila. Med. and Surg. Reporter.*

THE EMBRYO OF THE TAPEWORM.—M. Poincaré, of Nancy, has recently announced (*Comptes Rendus*) that he has discovered a new parasite, which he describes as an embryo of tænia. This parasite has heretofore been known simply as the corpuscle or utricle of Moscher. The supposition that it is the larva of tænia is novel, but it helps to explain the noxious power of beef in which no tænia are found. The most persevering search rarely discovers the unarmed cysticerci even in the beef of countries where tænia (*t. mediocanellata*) extensively prevails.

THE EFFECT OF ALCOHOL ON PIGS.—At the meeting of the Medical Section of the French Association for the Advancement of Science, MM. Dujardin-Beaumitz and Audigé reported the results of their experiments with alcohol on pigs. They wished to see what would be the effect of the continuous use of small doses of the drug, and gave daily in the food from 1 to 2.7 grams (gr. xv. to gr. xl.) per kilogram (2 lbs.) weight of the animal. This amounted to above 200 grams per day. After keeping this up for a year, they found it had produced no visible change. But they did not think that enough time had elapsed to form any definite conclusions. In the hog, large doses of alcohol do not produce excitement, but simply causes a deep and quiet sleep.

NEWS AND MISCELLANY.

A MANUAL OF OPERATIVE VETERINARY SURGERY is being prepared for the press by Mr. George Fleming.

A GIANT HORSE.—A horse, foaled in Ohio, has been purchased by Barnum for exhibition. It is seven feet (twenty-two hands) high, and weighs 2,450 pounds.

A VETERINARY SOCIETY has been formed in Australia, called the Australian Veterinary Society. It has seventeen active and fourteen honorary members.

REGULATING VETERINARY PRACTICE.—English veterinarians are trying to get a veterinary act passed by Parliament. The object is to put veterinary medicine upon a legal basis, by obliging all veterinarians to pass an official examination before beginning to practice.

A NEW DISEASE broke out among the horses at Vermillion, D. T., last fall, which carried them off in about twenty-four hours. It puzzled the skill of the veterinary surgeons to tell what it was, and at last accounts the matter was still a mystery.

CONTAGIOUSNESS OF EPIZOOTIC DISCHARGES.—A boy named Fred. Palmer, of Elmira, N. Y., lost an eye during the epizootic epidemic, from direct poisoning. It seems that he had wiped his face with a handkerchief which he had used to remove some mucus that his horse had coughed on his coat sleeve.

CHARLES D. HOUSE, D. V. S., sued Leslie C. Bruce and others, proprietors of the *Turf, Field, and Farm*, for damages for alleged libel in calling him a quack in their paper. The case came to trial recently, before Judge Lawrence, of the Supreme Court, and the jury gave the plaintiff a verdict for $1,050 and costs, amounting to $1,214.80. The trial was a complete vindication of the character and professional skill of Dr. House.

TOTAL NUMBER OF HORSES IN THE WORLD.—It has been estimated that of the horses in the world, Austria has 1,367,000; Hungary, 2,179,000; France, about 3,000,000; Russia, 21,470,000; Germany, 3,352,000; Great Britain and Ireland, 2,255,000; Turkey, about 1,000,000; the United States 11,000,000; the Argentine Republic, 4,000,000; Canada, 2,634,000; Uruguay, 1,600,000.

The Central Park Zoological Garden.—We notice with much satisfaction that in the tax levy for the coming year, the amount of the appropriation for the support of the Zoological department of Central Park has been increased. This action we heartily commend, as this has now come to be regarded as a great educator of the masses as well as a source of pleasure to them. Whatever may have been the criticisms upon the management of other departments of the Park, against this there has not been a complaint in many years.

Blind Mares for Breeding.—Mr. S. Tam's mare, Clara P., of Fort Wayne, Indiana, gave birth to a filly, which is totally blind. The eye-balls are entirely lacking. I saw the filly a few hours after foaling, and again yesterday. The filly is lively, growing finely, and seems to get around in spite of its serious defect. The dam was originally gifted with seemingly good eyes up to the time she was five years old, when she commenced to have trouble with her eyes, which eventually resulted in her going blind. Clara P. is by Anthony Wayne, her dam a blind mare, quite a trotter, called Crazy Jane. Clara P.'s filly is a catch foal, the sire supposed to be a young bay stallion by Anthony Wayne, owned by Mr. Oliver Hanna. This seems to prove the unwisdom of using blind mares for breeding purposes. The horses in our city and surrounding country have all been troubled with the epizootic.—*Correspondence of Spirit of the Times.*

The Ration for Street Car Horses in this country is now pretty definitely fixed in all our cities. For summer, this ration is half oats and half corn, ground together, sixteen pounds to each horse, with twelve pounds of cut hay. In winter, sixteen pounds of corn meal, with the same amount of hay, forms the ration. Corn meal alone in summer is too heating; but in winter the corn meal seems well adapted to keeping up animal heat and condition, and, being cheaper than oats, is generally adopted in New York City; but in many other cities half oats is used the year round. If these companies would substitute clover hay for timothy, corn meal would make a well-balanced ration. The clover would make up for the deficiency of the corn meal in muscle-sustaining food. Clover is rejected because it is liable to contain dust, which may develop heaves; but this fear is groundless under the plan now adopted of moistening the cut hay and mixing the meal with it. It is fed in a damp condition, and, therefore, no dust can be present to affect the lungs. Clover hay is not properly appreciated as a food for horses. It has a higher value than timothy, and is usually sold $2 to $3 per ton lower in market. Corn is too much used by some car companies. It is a fattening and "heating" food *par excellence*, and not a muscle-builder. —*National Live Stock Journal.*

Death of a Veterinary Surgeon from Lockjaw.—Dr. Edgar R. Wing, of Needham, Massachusetts, a veterinary surgeon of note, died some weeks ago of lockjaw, after a short illness. He was attending a horse which was afflicted with this disease, and it is supposed that the saliva from the animal came in contact with a wound on his hand, and was the cause of his death. He was considered a young man of much promise. A short time since he opened an office in Newton, and had gained considerable practice there and in surrounding towns. He was twenty-three years of age, and the oldest son of Austin Wing, long a resident of Needham. While attending to business he complained that his jaws felt stiff and sore, and told a friend that he feared he had symptoms of the lockjaw, and was anxious to get home and consult his physician. He grew rapidly worse, and the disease soon terminated fatally.

We have received an interesting letter from the father of the late Dr. Wing, a part of which we give. It will be seen that he does not think there was anything like contagion in the case, in which opinion he is undoubtedly correct.

"He (Dr. Wing) had not been well for some time previous to this. About three weeks previous he had ophthalmia. Had a dry cough (nervous), complaining of a pain in his side, and he applied iodine to the side up to the time of the appearance of tetanus. The muscles of the body, neck, and head were affected; the limbs were not. His neck and jaws were immovable, his back drawn up, and the muscles over his bowels contracted, leaving a space of about three inches for the bowels. Respiration was unchanged, except at the last more labored. Spasms began on Saturday, P. M., six hours after he was confined to the bed. These were of a mild type, and seemed confined to the body. In the first one the heart beat heavily, then subsided until the second, after which it beat heavily to the end. The brain was not affected. I do not believe he took the disease from the horse. There was a slight dry spot on his thumb, resembling a bruise or blister. It was not inflamed."

PLEURO-PNEUMONIA ON LONG ISLAND.—Several cases of this disease were discovered by Inspector Rushmore at Hempstead, L. I., about Dec. 15. The animals were on a stock farm. Those diseased were killed, and the rest quarantined.

THE NATIONAL LIVE STOCK JOURNAL has been attacking a much advertised "hog cholera cure," and it has demonstrated very clearly the fraudulent character of the claims for the nostrum. Our contemporary waged a good fight, and comes out ahead, as usual. The *National Live Stock Journal* is the best periodical of its class in this or any country.

EXTINCTION OF PLEURO-PNEUMONIA IN HOLLAND.—It is asserted that pleuro-pneumonia has been stamped out of Holland entirely. The methods by which this has been done were, isolation, slaughter if necessary, and inoculation. This last means of guarding against pleuro-pneumonia is asserted to have been remarkably successful in Holland, and to have been demonstrated as a measure that should be widely adopted.

THE INCREASED TRANSPORTATION OF CATTLE FROM THE EAST TO THE WEST.—The extent to which cattle are transported from the East to dairy districts in the West is hardly realized. Nearly fifty thousand calves, for instance, were sent to Chicago alone in the last half of 1880. There is no surety that some of these cattle have not pleuro-pneumonia, and the danger of their conveying the disease to Western herds is imminent and alarming. It is announced officially that Chicago is already among the diseased centres, though this announcement is (very wisely) qualified. But if pleuro-pneumonia has not gotten West, it inevitably will do so, unless Congress arouses itself to some action.

FOOT AND MOUTH DISEASE IN ENGLAND.—A correspondent of the *National Live Stock Journal*, writing from England, says that a great damper to the trade has been caused by the recent outbreak of foot and mouth disease. The infection was introduced probably by a cargo of French sheep which had the disease. These animals were slaughtered at once, but the foot and mouth disease began to crop out very soon after this among neighboring cattle. It has since been spreading rapidly. There is nothing which gives such a practical check to stock interests as this disease. It has done more to reduce the number of horned stock in the United Kingdom than pleuro-pneumonia and cattle-plague put together.

TEXAS CATTLE FEVER NOT EPIDEMIC IN TEXAS.—In a paper read before the American Public Health Association, Dec. 7th, 1880, by Dr. Jos. R. Smith, U.S.A., Medical Director for the Department of Texas, the following statements, the result of an extended inquiry, were made regarding the prevalence of Texas Cattle Fever: That no epidemic disease prevails among Texas-bred cattle living and grazing in that State, but that imported cattle, soon after their arrival, are affected by a disease called Texas or Spanish fever, which is very fatal to them alone.

Dr. Smith stated that the deaths among Texas cattle while herding in that State, or while being driven East, were not very frequent, and that they were then generally due to exposure or starvation. The following facts regarding the cattle that die during transit East were given:

The *age* is from two and a half to seven years. The *liver* weighs from five and a half to fifteen pounds, increasing with age; this organ and the gall-bladder are generally healthy. The *spleen* weighs from one and a half to two pounds, and measures from ten to twenty inches in length by four to five in breadth. Various statements regarding the changes found in the viscera are given, but they are too vague to be of any value.

TRANSIT OF CATTLE IN RAILWAY CARS.—At a meeting of the Farmers' Club, in Cooper Union, Dec. 1st, Mr. J. R. S. Van Vleet, an aged agriculturist, read a paper relative to the treatment of cattle in transit from the West, and the sale of diseased meat in this city. Some of his statements were startling, and they created quite a sensation among the members of the club. He said that the health of this great city is imperiled by the treatment of cattle during their long journey from the plains to their Eastern destination. As the trade annually increases, so does the danger to health increase. Droves of cattle driven on foot to St. Louis generally arrive there in good condition. They are then crowded into cars not properly prepared for the transportation. There are no separate stalls, no means to divide the mass, and thus they continue in all their filthy and crowded condition to the end of their journey. To add to the misery of these poor brutes, no provision is made for feeding and watering them while in transit.

In this connection it may be stated that a new cattle-car has been invented, which provides as much as possible for the comfort of animals in transit. It allows of their being fed and watered, and of their getting good fresh air. The invention has the approval of Mr. Bergh and others. It is thought that it will save the six or seven per cent. loss caused by previous modes of transit from West to East.

APPROPRIATIONS FOR EXPERIMENTS REGARDING THE DISEASES OF ANIMALS.—The French Chamber of Deputies has appropriated 50,000 francs for M. Pasteur. The money is to enable him to pursue his investigations into the infectious diseases of animals, a work upon which he has now been specially engaged for four years.

THE LOSSES FROM HOG-CHOLERA IN ILLINOIS during the years 1877-8-9 are shown in the following table:

	1877.	1878.	1879.
Fat hogs sold, ...	2,455,573	2,271,493	2,543,278
Gross weight, ...	618,804,396	555,955,097	702,102,812
Number died of cholera, .	1,445,268	1,391,422	676,738
Total weight died, . .	106,949,832	139,853,508	49,326,591

The losses in Iowa, Indiana, and several other Western States nearly equal those of Illinois.

FASTING FROGS.—An immense bull-frog which was put in the pathological laboratory at the Columbia Veterinary College, in November, 1879, is still living and lively, having had but two meals in the mean time. When first obtained he was placed in the glass aquarium along with three small frogs. These he at once proceeded to eat up. After this he had no other meal until the succeeding July, when he was given half a pound of beefsteak. This he swallowed at once, after which he looked as nearly the size of an ox as a frog ever did. That meal lasted him till December. At date of writing he appears somewhat emaciated, but could probably stand it another forty days at least.

A National Cattle Commission, and the Exportation of American Cattle.—The annual report of the Secretary of the Treasury for 1880 contains the following facts and recommendations regarding the exportation and importation of cattle:—"In a letter of Feb. 19, 1880, from this department to the Speaker of the House of Representatives, the attention of Congress was called to the prevalence of the disease known as pleuro-pneumonia, or lung plague, in neat cattle, and some recommendations were made as to the proper legislation on the subject. It may be assumed that this disease has never existed in this country west of the Alleghany Mountains, and that it has not for a long time existed in Canada, or in this country near the line of Canada. The exportation of live horned cattle from the United States is very large, and is rapidly increasing, the cattle going mostly to Great Britain. For the eight months ended Aug. 31, 1880, the value of such animals exported was $12,462,837, which is nearly double the value of the exportation for the same period in 1879. By an order of the Privy Council of Great Britian, all American cattle must be slaughtered at the port of arrival within ten days. The effect of this order is to prevent the shipment of any but fat cattle; and it entails great loss as to that class of animals, by compelling the immediate slaughter of such as are injured or become sick upon the voyage, and therefore of little value for food. It also prevents the owners from driving the cattle from the port of importation to a better market, or from keeping them until the market improves. Furthermore, there is a large demand in England for store or stock cattle, to be fed and fattened in that country for its own markets, a demand which this country could supply to an unlimited extent. It is believed that this trade, if unrestricted, might far exceed the trade in fat cattle. The losses and embarrassments by reason of the order for immediate slaughter, are, commercially considered, very great. The British Government, however, is ready to rescind it when it may be done without danger of spreading pleuro-pneumonia in their country through importations from the United States. The question of the rescission of the order has been the subject of official discussion between this Government and the Government of Great Britian, as well as in Parliament. It is believed that whenever Congress makes provision for the extinction or prevention of the disease, or for such security of the great routes of travel from the West to the seaboard as will make it reasonably certain that the cattle shipped from our ports will not carry infection with them, the order of council requiring immediate slaughter will be rescinded. The recommendation that a commission be created, whose duty it shall be to investigate reports of the existence of the disease, and to collect information respecting it, reporting the results to some department for official publication, is renewed. It is further recommended that such commission be authorized to co-operate with State and municipial authorities and corporations and persons engaged in the transportation of neat cattle, and establish regulations for the safe conveyance of such cattle from the interior to the seaboard, and the shipment of them, so that they may not be exposed to the disease; and that such commission, also, may establish such quarantine stations and regulations as may be deemed neccessary to prevent the spread of the disease by importations from abroad. It is believed that the legislation thus indicated, properly executed, will induce the Government of Great Britain to rescind its order for immediate slaughter, and thus promote a very large increase in the exportation of neat cattle from this country. Whether Congress should go further, and undertake the extirpation of the disease in the States where it now exists, is a question of more difficulty, and it is deemed best to leave that part of the subject for independent consideration."

FASTING HORSES.—From experiments made in Paris upon horses, the following conclusions were reached, viz.: (1.) "That a horse can hold out for twenty-five days without any solid nourishment, provided it is supplied with sufficient and good drinking water. (2.) A horse can barely hold out five days without water. (3.) If a horse is well fed for ten days, but insufficiently provided with water throughout the same period, it will not outlive the eleventh day. One horse from which water had been entirely withheld for three days drank on the fourth day sixty liters of water within three minutes. A horse which received no solid nourishment for twelve days was nevertheless in a condition on the twelfth day of its fast to draw a load of two hundred and seventy-nine kilos," about five hundred and fifty pounds.

TRICHINOSIS IN SPAIN.—According to a letter from M. Vic (*Ann. de Méd. Vét.*, *Sept.* 1880), veterinary surgeon at Barcelona, and the official communications of the veterinary inspector of abattoirs, eight persons succumbed to the effects of eating infected meat. Twenty-eight in all were known to have ingested trichinosis pork. The parasites were found in the meat and in the muscles of the persons who died, so that the matter of the cause of death was no longer doubtful. Prof. Mauri took occasion to urge the necessity of official supervision by competent microscopists, in order to avoid future calamities. Spain, it would seem, resembles our own country in the absence of this much-needed surveillance.

SUPPRESSING PLEURO-PNEUMONIA.—Pennsylvania has expended thus far nearly $4,500, says the *Boston Cultivator*, in suppressing pleuro-pneumonia, of which sum $2,365 was paid for killing 150 animals infected with the disease. Over 6,000 examinations were made, and the special agent is said to have traveled nearly 11,000 miles while in the performance of his duty. Maryland has been considered the principal source of infection, but as that State has in operation a law for the suppression of the disease similar to that in force in Pennsylvania, it is believed that its spread in that State will be effectually prevented.

HORSE TRADE IN CINCINNATI—The business in horses in this market during the past year, as shown by the returns of the Superintendent of the Chamber of Commerce, to be published in his forthcoming report, was the largest ever done here, except during the war, when phenomenal purchases for the army were made. The actual sale of mules and horses aggregate 28,516. The total receipts for the year were 21,733, and the shipments 18,137 head. The average price per head for horses and mules sold here was $72.25. The kind in best supply and most largely sought after was a medium grade of horses, which ranged from $65 to $85 per head, and the better class of strict railroad horses ranging from $85 to $110 per head. The demand for Eastern and foreign markets has been better than at any time since the war.

THE TRADE IN LIVE CATTLE between this country and Europe has so increased as to supersede in extent that in dressed meats. Five years ago the business was regarded simply as an experiment. In 1879 the shipments reached 105,324, of which amount 33,295 were live cattle, and 72,029 dressed carcasses. For 1880, from January up to the first two weeks of August, the shipments were 64,843 live cattle and 53,533 carcasses of beef—a total of 118,376. The trade amounts in money value to from $32,000,000 to $35,000,000 a year. With the removal of the restrictions on American cattle now imposed in Great Britain, the trade will no doubt attain still larger proportions, there being practically no limit to the supply of cattle available for exportation.

CONTAGIOUS DISEASES AMONG AMERICAN CATTLE.—Mr. G. Fleming, in a letter to the *London Times* on the above subject, says: The United States at present is quite as dangerous, so far as the importation of cattle is concerned, as the most pest-ridden country in Europe. Indeed, I am not certain whether it is not more so; as, through their utter neglect of veterinary medicine, and their independence of each other, the different States have no machinery by which to control, much less suppress, these calamitous disorders, nor uniform action in preventing its extension. Such is not the case in the poorest of the European kingdoms now on the scheduled list. It is true that a number of States are asserted to be free from the lung plague, but we know not—after our experience of such assertions, and knowing now how impossible it is to obtain reliable information—how far they may be well-founded. It is simply nonsense to talk about the small number of diseased animals which reach our shores from the States as evidence that the present restrictions should be removed or relaxed. Do those who talk know the damage that one infected animal may inflict? If they do not, let them read the history of the disease in South Africa or Australia. Some of these people make light of such contagions, and speak of foot-and-mouth disease as a trifling malady, which should not suffice to exclude foreign live stock from our markets. Here, again, they exhibit their ignorance with the history of animal plagues.

Foot-and-mouth disease has proved a more serious scourge to this country than the cattle plague. If the States are to enjoy an unrestricted traffic in food-producing animals with Great Britain, they should find it necessary to produce a sure and certain clean bill of health. The manner in which this is to be achieved is as well known to them as it is to us; but so long as there is a chance of success for the meat consumers' pseudo-friends they will not attempt it. Until they do so, it is to the interest of the nation at large that the present regulations be maintained and rigidly enforced, not only with regard to the United States, but to every cattle exporting country in which there is a case of contagious disease."

PARASITES IN FLIES.—The possibility that flies may be the bearers of contagions has led to some special studies recently regarding a fungous disease which affects the insect, especially at the fall of the year. The diseased fly may generally be found lying against the window, dead, with a zone of white particles about it. On examining it closely, the hairs on the fly will be found covered by minute white globules, similar to those forming the encircling zone. The abdominal segments are separated by distension, and the abdomen appears stuffed by something. On dissecting such a fly in glycerine and water, the cause of the distension will be apparent by the escape of a mass of mycelium threads, with similar spores to those surrounding the fly; almost all the soft tissues have disappeared, nothing being left save the tracheal tubes and the chitine, the fungus having preyed on the soft parts, and probably suspending its growth from lack of moisture. The fungus is called by Colin *empusa muscæ*. It does not seem capable of propagating the disease to other flies. Little is at present known concerning the life history of the fungus. Fungoid diseases affect many insects, notably the silk worm, the wasp, &c.

The appearances above described should not be confounded with those of the laying of eggs by the fly. When the female fly lays its eggs it dies, and the gross appearances might then be mistaken for funoid disease.

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ORIGINAL LECTURE.

ART. VII.—THE HISTORY OF THE HORSE.

ADDRESS DELIVERED AT THE OPENING OF THE COLUMBIA VETERINARY COLLEGE AND SCHOOL OF COMPARATIVE MEDICINE, NEW YORK.

BY LOUIS H. LAUDY, PH. D.,
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WHEN we consider the large number of animals distributed over the whole earth's surface, and are called upon to recognize them individually; the task might well be considered as hopeless. But by a systematic arrangement of *classes*, *orders*, *genera*, and *species*, this can be accomplished with ease.

The first thing, therefore, to properly and fully understand is the *classification* of the immense series of living beings composing the animal creation. Whether the system adopted be that of *Owen*, *Cuvier*, or others, the leading features, which are the same, should be understood by all.

According to Cuvier, living animals are divided into Vertebrates, Mollusks, Articulates, Radiates.

The *Vertebrates* are those with a back bone, and include fishes, reptiles, birds, mammals.

The *Mollusks* form a very large sub-kingdom, and include animals of very various and irregular shapes, whose envelope is soft, but generally protected by a shell. Oysters, periwinkles, snails, cuttle-fish, etc. are examples of this sub-kingdom.

Articulates are animals enclosed in a jointed skin, as insects, spiders, lobsters.

Radiates include all the lowest and least perfect members ot the animal kingdom.*

With this classification of four divisions of animal life, it is possible to assign the animal to his proper position.

The completeness of the above classification, so far as it relates to the more perfect animals, is sufficiently great, and we may therefore, take it as our guide.

The grand character that distinguishes the *vertebrates* is that they are in possession of an internal jointed skeleton, which is endowed with vitality, nourished by blood-vessels, capable of growth, and which undergoes a perpetual renovation by the removal and replacement of the substances that enter into its composition. The complete skeleton of a *vetebrate* may be considered as being composed of several sets of bones, employed for different purposes, consisting of a central portion, the basis and support of the rest, and of various appendages derived from or connected with the central part. The nervous system of *vetebrates* consists of the *brain* contained within the cavity of the skull. Connected with this, and lodged in a canal formed by the back-bone is the *spinal cord* which connects with nerves through the entire body. With the increased development of the nervous system, the organs of the senses assume a proportionate perfection of structure. The *eyes*, two in number, are lodged in cavities in the bony framework of the face. The auditory apparatus gradually becomes more completely developed. Organs of *smell*, *taste*, and *touch*, are found fitted to exercise their different functions.

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* To these four classes should be added a fifth, the Protozoa, which embraces the simplest forms of animal life. Another classification is the following: Vertebrata, Mollusca, Molluscoida Annulosa, Annuloida, Coelenterata, Protozoa.

The *blood* of all vertebrate animals is red, and contains microscopic corpuscles of variable form and dimensions. These are the leading characteristics that seperates them from all other orders. I have selected from the vertebrates one of the animals of the order, the *ungulata*, or hoofed quadrupeds, as this is the largest and most important of all the divisions of the mammalia.

It comprises three entire old orders, namely: *Pachyderms*, *Solipeds* and *Ruminants*.

The first of these old orders, *Pachyderms*, includes the elephant, rhinoceros, hippopotamus and others—the word Pachyderm meaning thick skin. The name is still used to express this fact, though the order is now abandoned. The second order includes the *Solipeds*, and in this order we find the horse, zebra and Ass. They are all characterized by the fact that the foot terminates in a single toe incased in an expanded hoof. They have a single stomach, and do not "chew the cud." The third order or *Ruminants* includes the *oxen*, *sheep*, *goats*, *camels*, *giraffes*, *deer*, and others that do chew the cud, or ruminate, and have two functional toes to each foot incased in hoofs. All these various animals are now grouped together into the single order of *Ungulata*, and the following are the characters of the order: All the four limbs are present, and that portion of the toe that touches the ground is always incased in a greatly expanded nail constituting a hoof. Owing to the incasement of the toes in hoofs, the limbs are useless for prehension, and only subserve locomotion, hence *clavicles* are wanting in the entire order. There are always two sets of enamelled teeth. The molar teeth are massive, and have broad crowns adapted for grinding vegetable substances.

The *Solipeds*, or animals of the genus *equus*, are those to which I wish now to call attention. The horse, is distinguished by the fact that the animal is not banded or striped, has no dorsal line, that both fore and hind legs have warts, and that the tail is covered with hair throughout. He is distinguished also by the fact that his hoof is undivided, and by the singular fact that he breathes through the nostrils only, and not through the mouth. Thus in outline I have given you the horse as Zoology teaches his position in the animal kingdom.

Let us pass from this and consider in brief the early history of the horse, which is a more notable one than that of any other animal. The announcement was that man should have dominion over every beast of the earth, yet the realization of that delegated power was the result of many centuries of slow and painful progress.

The history of Egypt furnishes, perhaps, the earliest record of the human family, and in it we find frequent record of the horse. By many it has been supposed that Egypt was his original home, while others dispute this, and claim that he was only distributed by the people of this ancient country. The country lying between the Tigris and the Euphrates, in Mesopotamia, where the whole race of mankind was collected together after the flood, this spot is given as the primitive home of the horse, and is the place where the best breeds (so far as the horse is concerned), are still found. This is the true Arabian horse. From this point he was easily brought into Egypt, where there was money to buy and sovereigns to use him.

In Biblical history the earliest notice we have of him occurs in Genesis, where the people are represented as giving Joseph in exchange for bread. The people mentioned in sacred history living upon the borders of Egypt, seemed to have placed a high value upon the *horse*, though all other domestic animals were abundant. Throughout India he continued to be very rare, even down to the days of Solomon, for that monarch obtained his horses from the land of Pharaoh.

Assyria, after Egypt, became celebrated for its cavaliers among the people of the ancient world. The prophets would exclaim of the horses of the Chaldeans, that "they are swifter than the leopards and more fierce than the evening wolves." Among the ruins of *Nimroud*, discovered by Layard, were found bas-reliefs representing Assyrians on horseback, not only engaged in hunting expeditions, but in actual war. Upon ruins in other cities of coeval date, horses and chariots are found in abundance, but in none is man seen mounted and going to battle. Until the discoveries of *Nimroud* it was supposed that the Persians originated equestrianism, but it seems that they only revived what had apparently been lost with the destruction of Ninevah. The plains Babylonia furnished horses to the Persians, which nation became renowned for its horsemanship. Persia, before the age of Cyrus, was nearly destitute of horses, but after that era, from personal example and encouragement of her kings, it is stated that every man in that vast empire rode on horseback. So rich did Persia become in equine wealth that one author speaks of no less than 150,000 horses feeding at one time upon a vast plain, near the *Capsian Gates.* The very name of the country comes from *Peresh,* a Hebrew word meaning *horseman.* We can thus trace through the dim traditions of the past, the horse leaving Egypt passing into Assyria and Persia, and following the rushing stream of population westward.

The Greeks soon became skillful horsemen, and they in turn taught the Romans their horsemanship, which nation soon rivaled its teachers. The Romans, it is said became more attached to their horses than did any other nation, and often carried the attachment to a height of folly and madness. Roman emperors have been known to invite their horses to sup with them, giving them food from golden vessels. They went to still greater extremes, making a horse high priest and consul. Verus erected a statute of gold to his horse, and fed him with raisins and almonds from his own hands. When the creature died he was buried with great pomp, all the dignitaries of the great empire attending, after which a magnificent monument was erected to his memory on the Vatican Hill. These two or three illustrations will give some idea of the horse's position, and the fondness displayed by owners at this early date.

The time and manner of the introduction of the Asiatic horse into Europe is not exactly known. The Persian war with the Greeks must have scattered them, as the Greeks captured at one time eighty thousand, many of which escaped. The Carthaginians introduced the Barbary horse into Spain and Sicily. From these two points the breed would naturally be dispersed over Western Europe. In the fourth century the Greeks who entered Europe by the north, and overran it as far as the Peninsula, dispersed the Asiatic horse in their track. In the eighth century the Saracens, with two hundred thousand horses, penetrated into France and were captured, and from this mixed breed was produced the Gallic horse, from which, no doubt, came the early English horses.

The introduction of horses upon the Western Continent dates back to the second voyage of Columbus in 1493. The first that were ever brought into the United States were landed in Florida in 1527.

These importations, from dissensions which followed among the masters, escaped all control, and finding a home in the wilderness, multiplied to an incredible extent. They, with the horses introduced into Mexico by Cortez, and into Peru by Pizarro, have filled the prairies of the north, and extended in countless numbers upon the pampas of the South. Upon the plains extending from La Plata to Patagonia are to be met single troops numbered by tens of thousands. The color of the "American wild horse," as some call it, is generally chestnut, but many are dark bay. They differ from those of Asia in being easily tamed. In fact, so readily are they subdued, that they cannot be said to exist in a truly savage state.

The speed of horses has always been a matter of admiration. The Orientals use the most beautiful expressions when alluding to this subject; they say, "Horses are birds which have no wings." "My steed has the wings of the wind." "Hast thou made him to leap forth like the arrow." Among the more matter-of-fact people of temperate climates, we find equal exaggeration, but expressed in less poetical language. The meaning of "low down in the twenties," is, if analyzed, quite as much as to say, for horses, nothing is distant.

Careful investigation clearly shows that *horses do not degenerate in America*, as some writers would try to prove. We have rather the best of the argument, for our *trotters* are the best in the world, as well as the most enduring, and when tried upon English ground have always maintained their reputation. No horse but an American one ever trotted *in harness* in 2-10¾. Before the introduction of railways, the horse was the swiftest mode of conveyance man possessed. When extraordinary distances were made in a given space of time, the details were sent around as exciting news, and recorded among the wonderful events of the day. Many cases could be cited, and all are full of adventure. Sir Robert Carey rode 300 miles in less than three days when he went from London to Edinburgh to inform King James of Queen Elizabeth's death. In more modern times General Lafayette displayed his zeal and strength by riding from Rhode Island to Boston, nearly seventy miles in seven hours, and delivering a message to Washington. He then immediately returned, making the distance in six-and-a-half hours.

A highly interesting volume might be written upon the *garniture of the horse.* It was not customary in ancient times to shoe his feet with iron according to our modern practice. In oriental countries, the dryness of the soil made an artificial defence of the hoof, less necessary than it is in the mire and the muddy ways peculiar to the north of Europe. Necessity first suggested the shoeing of horses and custom confirmed the practice. Yet nothing is more abused for a want of proper knowledge, than the imperfect methods of shoeing a horse as practiced by most of our horseshoers of the present day. As veterinary science advances each year, we find a corresponding inprovement in the care and treatment of horses feet, and with a full and proper knowledge of the anotomy of the foot, all the old methods will be superceded by those of good common sense horseshoeing.

The ancients used no saddles, judging from all sculptures that have been preserved. Many rode without even a bridal, and thus resemble the Indian tribes of our day. The sculptures of Khorsabad represent the riders "bare-back." The Elgin marbles are without saddles, but the want of these things is more than compensated by other trappings, in particular the bridal and reins which were of extraordinary splendor. In the bas-reliefs found in Nineveh, the trappings of the horses and chariots are remarkable for their richness and elegance. Above the heads rise gracefully plumed crests ornamented with long streamers of many colors. The bridal consists of a headstall, a strap divided into three parts, joining the bit together, with straps over the head, under the cheeks, and behind the ears.

The bits as well as the metal used in the harness were often of gold and other precious metals. The manes and tails were bound in the centre with ribbons adorned with tassels, and the cloakings were studded with diamonds and precious stones. The most gorgeous display of cavalry of modern times must be incomparably behind those early days in everything that constitutes grandeur, either in numbers or costly equipments.

The Horse as an Article of Diet.—The size of the brute rendered it conspicuous, and it is presumed that he was first hunted alone for food. Compared with the flesh of the horse, the ox is coarse in the extreme. The muscular fibres of the horse are delicate, and the colors they displayed defy the pencil by their beauty. The muscles are arranged more symmetrically than those of any other animal, and the general aspect of the creature's frame, upon dissection, enforces the idea of a beast of superior order. Few have ever made themselves acquainted with the beautiful mechanical construction of the horse without imbibing a higher respect for him than is realized by the superficial examination of his outside form. But all this rather destroys than tempts the human appetite. Acceptable as the flesh may have been to the pallates of the early representatives of mankind, it is probable they were not able to indulge in an excess of this food, from the fact that the value debarred them, together with the difficulty of capturing the animal, as the horse cannot be taken by surprise. Once alarmed, pursuit was hopeless, and it is therefore probable that they were captured by means of pitfalls and other contrivances peculiar to the nation. The carcass was alone desired—the life of the victim was in no way regarded. The Scandinavians and Germans devoted to the worship of Odin, raised with the utmost care, in "sacred pastures," a breed of white horses that were sacrificed on certain occasions, and the flesh served up at the festive board From this perhaps originated the taste for such kind of food, a taste which existed among all the nations of the North, or until

Christianity penetrated Europe and succeeded in destroying this custom. The tribes of Northern Asia have preserved a marvelous liking for horseflesh. It is their favorite dish, although they have cattle in abundance.

Hazzard, a French veterinary surgeon, has stated that during the French Revolution, the greater portion of the meat consumed in Paris for six months was supplied by horses, and the public health did not suffer in consequence. In South America they esteem the horse the best of food, and prefer it to the wild cattle. The Danes, as late as the year 1807, during the siege of Copenhagen, authorized the sale of this meat.

Belgium may be quoted as having partially followed the example of Copenhagen, and the Austrian Government has recently authorized the sale of horseflesh. In Sweden horseflesh is looked upon as a great delicacy, and the wealthy class take a sandwich composed of bread and a thin slice of the animal highly salted, and this is considered a great treat. In this country most people are shocked at these practices, and will turn away disgusted with the offer to partake of what in other countries is considered a great treat. At first mention we heartily condemn the custom, yet we eat our bologna sausages without a wry face, and have thus been initiating ourself into the mysteries of consuming horse meat.

The *age of the horse*, up to eight or ten years, is correctly given by an examination of the teeth, those useful appendages through that period of time undergoing more transformations than in any other animal. It requires the practiced eye of a veterinarian to determine with a degree of precision the age of a horse, although we find many that will examine the mouth from mere habit, and then turn aside with a knowing look or a sly wink, and whisper, "twelve years." Should you ask them how they determine the age, they will tell you that their grandfather posted them, and that no horse doctor could cheat them.

When *well* treated, the animal lives to a good old age, but from the abuses he receives, his best years are from five to ten. Oftentimes he will remain serviceable for twenty years or more. An incident is recorded of a horse reaching the wonderful age of seventy years. “Copenhagen,” the charger that carried Wellington at Waterloo, died at the age of twenty-seven. Copenhagen was buried with military honors, but his remains failed to remain long in repose; a curiosity hunter dug them up, stole one of the hoofs and a few other parts, and made good his escape without ever being discovered. The skeleton of “Marengo,” the horse Napoleon rode at Waterloo, graces the museum of the United Service at London. This is in a glass case, and there is no chance to get a hoof.

Price of the Horse.—In all ages horses have commanded high prices. In Solomon's time great prices were paid for horses. The wholesale price under government contract was 150 shekels, which is about eighty-seven dollars, a great sum of money in those days. To form some idea of his wealth in horses, I will present a few figures. Solomon had four hundred stables, forty thousand stalls, and twelve thousand horsemen, an amount of money invested that, even in our extravagant days, would figure in the millions.

In our own times we find enormous sums paid for horses, and price bears a certain ratio to the speed.

As the time is reduced, so is the horse's value increased; and it might be something in this order:

Time 2.10, not reached as yet.	
“ 2.10¼	$175,000.
“ 2.12	100,000.
“ 2.15	75,000.
“ 2.25	5,000.
“ 2.35	1,000.

From this to three or five minutes, the price is according to style and action, until at last it is a question whether the horse pulls you or you pull the horse.

Diseases of the Horse.—The constitution of no animal seems to be more subject to derangement and disease than the horse. For the alleviation of these and other suffering animals, the Columbia Veterinary College has been established. The student of veterinary science should be deeply impressed with the importance, nay, the indispensable necessity, of a profound and intimate knowledge of the entire structure of the horse. Such knowledge can only be obtained by a systematic course of study. Although veterinary science is becoming more prominent in this country, its importance is not as yet appreciated as it should be, for it is only within the past few years that it has been accepted as an educational branch of study.

By slow degrees and perseverance, with the valuable aid of many well-trained minds, there has been finally established a well-arranged system of teaching veterinary medicine. We have also now many excellent text-books on the subject of the anatomy and pathology of the domestic animals.

Columbia Veterinary College.—With such helps we have established a college that has met with an assured success, and which stands as a monument to attest our wisdom in our undertaking.

The intelligent citizens of this community cannot fail to appreciate the liberality of the many minds that have worked together to build up this institution. We have labored together and have systematized a course of studies that are comprehensive and as nearly complete as possible, and important to the wants of the veterinary student. This institution has been established at private expense. Time, talents and money have alike been devoted to promoting its worth and success. It is hoped that the institution will be found every way worthy of the cause to which it is devoted.

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ART. VIII.—TRANCE AND TRANCOIDAL STATES IN THE LOWER ANIMALS.

TRANCE is a concentration of nervous activity in some one direction, with corresponding suspension of nervous activity in other directions.

This state can be induced in all animals, higher and lower, where there exists even the rudiments of a nervous system.

Trance is a purely psychological state, and is to be studied by psychological methods; but it may be induced either psychologically or physiologically, or by both combined. We can only arrive at a true conception of its nature and its laws by psychological reasoning and observation; and the study of the subject belongs preëminently and exclusively to psychologists. The physiologists of the world, either in this or preceding generations, have not, as a rule, experienced interest in the phenomena of trance, and when they have attacked its problems have failed, if not entirely surrendered to delusions. In this organized stage of trance, into which we are now entering, the subject must be developed mainly or exclusively by psychologists.

It has taken several centuries of slow evolution of ideas on this subject to bring it out of the stages where it was supposed to be the property of non-experts in all science; next of scientific men in general, including physicists, astronomers and botanists; next to surgeons, next to physicians, next to general physiologists, next to special physiologists, next to neurologists—students of the nervous system; and finally, to that special department of neurology called psychology, by which it is to be organized, made verifiable and viable, and is to become the common and permanent possession of mankind. All sciences have passed through these stages, either slowly or rapidly; the history of trance is not, in this respect, any way peculiar.

Trance in the lower animals, as in man, can be induced by various procedures, which in their various permutations and computations may be numbered almost by thousands, and the belief, almost universal among scientific men, even those who have given much time and labor to these phenomena, that there is some peculiar, definite, and circumscribed virtue in any one procedure for the inducing of trance in animals, is as unscientific, and as far out of harmony with the facts, as is the same principle in regard to inducing trance in man. And as in man, the form of trance to which attention has been longest and most frequently directed—induced trance—is, when broadly and philosophically analyzed, but a part and a fractional part of trance in general, and one of its varieties only, and to be scientifically studied only in its relation to the other varieties and as parts of the great whole, so in the lower animals, trance induced by any of the methods and processes hereafter to be noted, is but a variety of the general trance state to which lower animals and higher animals are alike liable; and the same law governs all the phenomena, whether occurring in man or in the animals beneath him, or whether brought about by any manœuvrings or manipulations, or occurring spontaneously in health or disease.

To study trance in the lower animals separately from trance in higher animals is indeed scientifically impossible; since, if we do not understand this trance state in any one animal higher or lower, we cannot understand it in other animals; but if we do understand it in any one animal, however low in the grade of the animal world, we can also understand it in its general principles in all those that are above it. The more complex the phenomena of life in any animal out of trance, the more complex the phenomena of life in that animal when in trance. Hence, trance in man is, out of all comparison, a more valuable scientific study than trance in any of the lower animals; and trance in finely organized, intellectual and sensitive natures is, in its manifestations, far more rich, imposing, and valuable than in the coarse, dull, and phlegmatic. The special subject, then, of trance in the lower animals is of interest chiefly as a part of the general subject of trance in the higher animals; just as insanity or epilepsy in the lower animals are of but little interest save as parts of the general scientific study of epilepsy and insanity; and to begin and to end our study of trance by experiments on animals alone, as some have done, is most unscientific, unwise, and unsatisfactory. If trance could be induced in animals alone, and not in man, we should never know anything of trance; it is only by reasoning downward from the phenomena of trance as they appear in man, that we can be able to understand and coördinate the same phenomena as they appear in the lower animals. Trance, indeed, like insanity, could not be understood at all if it were studied in animals alone.

Among the many influences or combinations of influences that are employed to disturb the mental equilibrium of an animal, so as to cause increase of nervous activity in some one direction and corresponding suspension of nervous activity in another direction, so as to put him in trance or the trancoidal state, the following are the most familiar, accessible and usuable.

1st. Acting on the emotion of fear, by reducing the animal to helplessness, by tying or confinement of some kind. This method is very effective, when united with some movement or manipulation that makes a strong physical impression, as when we turn a chicken's head under its wing, or place a horse on his side with one of its legs strapped, so that he is unable to help himself, or take hold of a crab in such a way that it cannot defend itself. The voice and the eye may reinforce the tying and confinement.

2d. Making strokes or passes on, over, or near an animal. The effect of these manœuvrings and manipulations gave rise to the delusion of animal magnetism, and by the same process of reasoning, gave rise to the same delusion in regard to man.

3d. Staring—fixing the eyes steadily on the eyes of an animal.

This is one of the methods by which lion-tamers succeed in preserving their power over wild beasts in their cages. In England, this last year, I saw somewhere the picture of a celebrated lion-tamer on the point of being torn to pieces in the cage of a leopard. The story is that this tamer never allowed himself to take his eye off this leopard, which was more wild than any other animal under his care; but the paw of the lion happened to fall on his shoulder as he was sitting down, and threw him off his balance, so that his eyes were for an instant taken off the wild beast before him, and this gave the animal opportunity to jump on him and destroy him before he could be rescued.

Why it is that the simple process of staring or gazing at an animal or a man produces trance or a trancoidal condition in the object stared at, is a psychological question of much importance in its bearing on this whole subject. This process is only one of very many processes, or variations of processes, that may be used to produce that disturbance of the mental equilibrium known as trance; but it is one that has been very much employed, especially in the entrancing of animals, and it enters more or less as a constituent into very many other processes.

The eyes of a corpse have no power, but the eyes of a living creature have great psychological power of a purely subjective sort on the living object on which they are fixed; hence the expression, "Evil eye," so familiar in the history of witchcraft.

The brightness of the eye, united with the variations in expression, corresponding to the variations in the mental emotions, are the elements which produce this effect of one living being over another living being; the fixed gaze by which the mind of one being, so to speak, shoots out through a bright, shining, glistening instrument, to the eyes of another being, exerting, on simple psychological principles, an influence of a most powerful character, and produces, or is liable to produce, either full trance or a trancoidal state; hence the expression, "If I can only catch his eye, I can succeed."

The study of the morbid fears of neurasthenia, or nervous exhaustion, is instructive on this point. Sufferers from the fear of man—anthropophobia—cannot look any person straight in the face; they can look at any other object—at any inanimate thing, it may be—but they cannot squarely face a human being of adult years for whom they feel respect, simply because of the loss of cerebral force. As a person thus afflicted becomes stronger, he finds that he can look directly into the eyes of any person.

Even a person in good health, if he is moderately sensitive, cannot look any one in the face for a long time, with ease, provided the other person is conscious that he is being looked at by him. In large audiences everybody looks at every other body, but no two persons look at each other long at a time. We select a person to look at who is not looking at us; and only in this way are we able to see each other; hence the habits of staring and glaring become the symbols of bad manners.

The above is the psychological elucidation of the long and well-known fact of the power of the eye to control animals, even the most savage and ferocious.

I am told by Dr. M. Josiah Roberts, that in hunting alligators, and sometimes, also, in hunting birds, in Florida, he found it possible to fix his eyes upon the animal or the bird, and to approach them so steadily while keeping his eyes thus fixed, that he could come very near them before shooting.

It is one of the conditions of all experiments of this kind, that there be no outside disturbing influences; the hunter must approach quietly, without making any noise, and there should be no noise from any other source. In experimenting with dogs, cats, and fowls, it is usually important, if not even necessary, to have the room still, and for the spectators to remain as quiet as possible while the experiment is going on; and even after the animal is entranced, the opening or closing of a door, or even a less noise, may cause the spell to be broken.

The reason for all this is clear enough: the concentration of nerve-force of the animal in some one direction which is brought about by gazing, or fixing the eyes upon it, is interfered with by the excitation of any other sense of a different kind from that which the operator is using. This would be expected from our theory of trance.

Even in experiments with human beings, where the subject is not perfectly trained, any noise on the part of the bystanders will spoil the experiment, and on the same principle.

4th. Bringing a bright light in sight of an animal.

This is a very effective procedure for the producing of trance, or a trancoidal state, in almost all kinds of living things that are endowed with nervous systems. This gazing is itself a concentration of force, which is the very essence of trance. Like all concentrated effort, it produces speedy exhaustion, which is often relieved by sleep.

The same method is very effective also in man.

5th. Music, either of the voice, or of instruments.

The power of music to charm animals has been well known for thousands of years, and, like the power of snakes to charm birds, has been observed and analyzed years before the scientific study of trance was thought of.

Thus we see that anything that causes concentration of nerve-force, through any of the emotions, especially of fear, through the general sensation, or through the nerves of special sense, trance or trancoidal states may be produced in animals just as in man. Man, however, can do what animals are not sufficiently intelligent to do, that is, keep from going into trance by voluntarily concentrating the mind in some other direction while the experimenter is operating on him. Any of my subjects, however well and long trained, can keep me from putting him into trance by simply thinking persistently of his mother or sister, or of any other person or thing that can be imagined. This I have proved by many experiments.

Trancoidal States.—Trance is a matter of degree; here, as everywhere else in nature, there are no leaps, jumps or surprises, but in a strict scientific sense, only evolution and development, each process preparing the way for another. There are, therefore, all shades and gradations of the trance state, from the complete trance, simulating death, down to a trifling and momentary fascination, and just as we have epileptiform, neurasthenoidal, or insanoidal states in man, which are in the neurasthenia, or insanity, so we have trancoidal states of all directions of epilepsy, gradations, from the highest to the lowest, scattered all along the road that leads to the full and complete trance.

TRAINING HORSES.

Rarey's Method—Charles Hall, M.D., and veterinary surgeon, gives me the following experience, illustration of Rarey's famous method of training horses: He was in the State of Missouri a number of years ago, stopping at the cabin of a friend, and he was challenged to ride a filly with a bad reputation, that no one of those western experts in horses could ride. The horse would throw every one who attempted to ride it. Dr. Hall went to the filly as she was led out by three or four men, and they held her while he applied a strap to the near fore-leg below the fetlock, and then flexed the leg and fastened it in that position to the upper part of the leg; then gently fastened the surcingle to the body; then very carefully he fastened another long strap to the off fore-leg below the fetlock, and passing this long strap between the surcingle and belly of the horse, he told the men holding the horse to get out of the way. Then tying the bridle reins short over the neck of the horse, and taking a short, firm hold of the longer strap with his right hand, he gently pushed the horse to the right off her balance, and she fell upon her knees. The horse struggled furiously for three or four minutes, then reared, landing on its knees after every effort. In about ten minutes the horse became nearly exhausted, and then he gently pushed it over on its side. Then he fastened the off fore-leg in the same manner as he had fastened the near fore-leg.

Then the horse, after resting a few moments, began again to rear, and struggled to get free, landing on his knees every time he reared as before. While the horse was resting, Dr. Hall stroked him gently, and after a while he put a saddle on him and got on him; the horse's legs being still fastened in the manner described, but all the while proceeding with the greatest gentleness. At length in a few moments he unfastened the near fore-leg, and induced the filly to get up on three legs, the doctor remaining on its back. The doctor then dismounted and mounted two or three times, the filly standing on three legs and not offering to stir from its position. Then the doctor again strapped the near fore-leg and laid the filly down as before; then talked soothingly, patted her, and put the saddle and bridle off and on two or three times; then, taking off both straps, he started on a ride of four miles without any difficulty. The neighbors looked on in astonishment, expecting that the horse would conquer, as he had conquered all others who had tried to ride it. The next day the filly threw him once, although on but three legs; he never attempted it afterwards. It became a good horse; so impressible did it become that on merely touching the fore-legs the horse would immediately lie down. If a rope be fastened in the mouth of a horse and around the lower jaw, and the other is fastened around his neck, the horse becomes helpless, and feels his helplessness, and will follow his master round and round like a child. This experiment has been done in my presence by horsemen.

House's Method.—Dr. House has kindly exhibited to me his method of operating on the mouths of horses. I have seen him go up to a horse that was famous for biting, and put his fingers, hand, and arm up to the elbow in his mouth, and manipulate at leisure; the horse apparently relishing it, certainly showing no sign of anger or dissatisfaction; and this he does with equal ease on a horse he has never seen before.

It matters not how wild, furious, ugly, or unmanageable the horse may be. It is not necessary that the horse should be tied or held; but it is more convenient to have him in a stall where he cannot run away.

Dr. House further tells me, that savage horses frequently rush at him, but that he always stops them by his voice and manner. He also castrates horses without using anæsthetics, or confining them. He tells me, also, that he has no doubt that he could whip a horse to death, in the open field, where he was not confined or tied in any way. The secret is to approach the horse suddenly, and with a vigorous manner, and with a loud voice, strike him a blow so powerful, that he is paralyzed with fear, and cannot move, just as he is liable to be paralyzed while standing on a track as a train is approaching. Dr. House professes, also, to be able to subdue horses as well as Rarey could, without the appliances that Rarey used.

Through all these performances on horses, or elephants, or dogs, or hens, or crabs, or geese, or human beings of a high or low organization, there is one common principle, which, when once fully understood, reduces all to consistency, unity and clearness, viz.: the feeling of helplessness and subjugation in the animal operated upon.

When once that feeling is produced by the eye, by the voice, by manipulations, or by the sudden infliction of pain, the operator becomes the master, and can do with the animal as he pleases.

In order to become the master, the operator must feel that he is such, and act accordingly, else he will fail. Practiced operators abstain instinctively from all manifestations of fear, or even doubt or anxiety.

The horse is a timid, and, save in narrow lines, as in memory of places, a stupid animal, else he could not be so easily frightened and subdued.

Elephants.—Mr. W. H. Cross has given a lifetime to the study of elephants in their native countries and in menageries, tells me that these animals are subdued in the same way that Rarey subdues horses, but, being bolder and stronger, and more intelligent, require more time and force for their subjugation. By ropes and pulleys their fore and hind legs are stretched out so that their bellies rest on the earth, and by another rope with pulleys are cast on their side. In this position they will remain for hours, sometimes for days, before they are subdued. The sign of submission is a yell or scream, and it is unsafe to unloosen them before this sign is given. Mr. Cross declares they are governed wholly by fear, and not at all by love; they have no affection for their keepers, and as a law it may be stated that all wild animals ever controlled by man, must be subjugated and kept in subjugation through the emotion of fear.

In 1839, Dr. Wilson, of England, published a work on the effects of trance on the animals in the London Zoological Gardens. He speaks of experiments made on the following animals: horses, cows, calves, leopards, a lioness, cats, dogs, pigs, horses, fowls, turkeys, ducks, geese, maccaws, fish, roach, dace, gudgeons and loach. The method which he employed was to make passes, in the old style. The time required to produce trance sleep varied much in different animals, and in the same animal at different times, all the way from five minutes to an hour. With pigs, from three-quarters of an hour to an hour was required. There were many failures in all these experiments.

The effect on dogs were at first, restlessness, playfulness, stretching, yawning or trembling. On cats there was irritability, sometimes quarrelsomeness. He says that the lioness stopped eating, and grasped a joint between her jaws and kept it in her mouth without letting go her hold for twenty minutes; her eyes were closed only at short intervals. On leopards the experiments were failures. One of the elephants was put to sleep in five minutes; previous attempts, kept up for an hour, made him nervous and irritable.

Those who attempt these experiments, either on the savage animals of the menageries, or on the animals of the household, will meet with more failures than successes, just as with similar attempts on human beings. Indeed, the failures are as much a part of law as are the successes, and are not mysterious. It was quite clear, that in these experiments of Dr. Wilson, the animals were not thrown into a full trance as a rule, but into a trancoidal state. In some of the animals, as pigs, the excretions were affected, and there was sweating about the ears and neck.

The experiments of Czermak, which have been recently repeated to a considerable extent in Germany, England, and in this country, and the facts of which have for centuries been known to the laity, need not be referred to here, except to enforce attention to the fact that the phenomena are obedient to the same laws as similar experiments on any other animals or in man.

In experiments on dogs, cats, and guinea pigs, we must expect to meet with many failures; and we may get out of patience before the animal shows any sign of geting into a trancoidal state. With all these animals, the methods of producing this condition are very numerous: making chalk lines, holding coins or other bright objects before them, pointing the finger closely at them, striking the back, or tickling behind the ears, strapping or confining their limbs, and then striking them, or pointing at them, etc., etc., etc.

With hens, the success is more uniform according to my observations, than in dogs or cats or pigs. The old experiments of placing the head of a hen under her wing, and then tossing it about for a moment, and afterwards laying it down on a table, is one that can be repeated by anyone, and with results that are pretty constant; similarly the experiments on crabs or guinea pigs give pretty uniform results.

Jack Shooting of Deer.—In this country it has long been the custom to shoot deer at night, by the aid of a strong light on the hat of the hunter or on the prow of the boat. I have several times had an opportunity to engage in this amusement in our northern woods.

The conditions are the light boat, with the boatmen in the stern who pulls in a noiseless manner; the hunter in the bow of the boat must also keep perfectly still, holding himself in position to be in readiness to shoot whenever the deer at the water's edge becomes dazed by the light. This dazing is a trancoidal condition, although not full trance; but it is quite sufficient to keep the deer from doing precisely what would be the best thing for him to do, and what he would do if he had full control of his faculties—run away—and compels him to remain still until he loses his life. Other animals are sometimes hunted in the same way.

Fishing with torches on the boat, and the tendency of moths and other insects to drive themselves furiously against the light, have a similar explanation.

The familiar habit of catching fish by tickling, is also an illustration of what we are here describing. In New England, it has long been the custom to tickle suckers until they become insensible, and then catch them; and trout are frequently caught in this way at certain seasons of the year.

The Iguana, a species of lizard in the Bahamas, is caught by the following process: A negro carries a long cord with a whipcord at the end; on discovering the game on the limb of a tree, he begins to whistle; the animal stretches out his head, seeming to listen intently; the negro continues to whistle softly, cautiously advances, and tickles the animal with the cord; the animal seems pleased with the process, turns on his back, stretches himself out like a cat before the fire, manifesting the most perfect contentment. Soon the negro, by a sudden jerk of the cord, brings him to the ground.

It is stated that turtles will sometimes come out of the water at the sound of whistling, and crawling on logs, remain there as long as the whistling continues ; stretching out their heads as far as possible, showing every appearance of enjoyment ; and it is also claimed that at such times one can handle them without difficulty.

Trance in the lower orders of Man, as compared with Trance in the lower Animals.—The philosophy that I have tried to make clear in all my writings on this subject during the last few years, is that trance is a generic state, applicable to all living beings endowed with nervous systems ; that, in short, it is unity, whether existing in the lower orders of man or in animals, or however induced. He who does not start out from this point, can never reach the truth on this subject of trance. What the phenomena of trance are among intelligent men and women, I have elsewhere, and many times, described in detail.

Experiments on the *lower* order of human beings have not, so far as I am aware, been studied in a thorough scientific manner.

On the islands of the South, between Charleston and Savannah, there are thousands of negroes who, from their geographical isolation, have been at no time brought in contact with any considerable number of whites, and who, therefore, in their intellectual development, represent the primitive negro with some slight improvement.

I have had good opportunities for studying these people, and have found their psychology in many ways interesting. Their language, although professedly English, is so different from ours, that it is difficult for a stranger to converse with them. We do not understand them, and they do not understand us ; and the vocabulary of the majority of them is limited to a very few hundred words. They seem to be almost as superstitious as their African ancestors, despite the influence of the Christian religion, and their opportunities for attending school since their emancipation. They have the capacity neither for forming general ideas, nor for carrying two ideas in the brain at the same time ; in all respects they are dull, slow, short-sighted and unambitious, quite inferior to the style of negro sometimes seen in the North, and in other portions of the South.

I had some curiosity to see how trance experiments would work with these people, who may be regarded as somewhere between the higest order of animals and the lowest order of men; and this year, while making a short visit to these islands, I subjected quite a number of them to experiments. In order to get a chance to make these experiments, I caused notice to be sent around among them, by one of my friends, that a "shout" would be held in the barn. "Shout" is the negro term for an African dance of a peculiar and monotonous character, united with singing. It is a very popular amusement with negroes of the South, and when the chance is offered with a cheap entertainment added, they will keep it up all night.

Quite a large number assembled at the appointed hour in the evening, and I subjected several of the young ones to the experiments, but met with considerable difficulty, from the fact that I found it impossible to make them understand what I wanted. Some of them professed to be asleep, in order to deceive me, but in a very bungling way. I placed a number of them on a bench, and directed them to look steadily at a bright light. They did so, and in about ten minutes one of them became so thoroughly entranced, that I had him taken off the bench and removed to another part of the room. The "shout," a very noisy performance, then went on, but he did not waken. This greatly astonished the people, who gathered around, and they manifested much superstition in regard to his condition. While in this trance-sleep the pulse was natural, the eyes, as usual in such cases, resisted the attempt to open them, and rolled upward; and the whole expression of the face was that of one in profound sleep ; but it differed from normal sleep in this, that it was more profound, and we had some difficulty in arousing him. On coming out of the condition, he looked about with a dazed expression, and asked how he came from that bench, showing that he had been unconscious from the time he went into the sleep, and knew nothing of being carried from the bench to the place where he was lying.

This primitive negro was entranced in the same way that animals are entranced, or human beings of any order of intelligence; by gazing upon the light, the nervous energy was concentrated in one direction, with corresponding suspension in other directions. I used that method as, on account of the slight degree of intelligence on the part of the audience, I could not, very well, use my numerical method—stating that, on my counting twenty-five, they would be asleep; they could not understand my language or pronunciation.

The effect of silence, as in the entrancing of animals, was noticeable in this experiment. While others were laughing and making a noise, there was no success; but as soon as silence was enforced, the subject went to sleep.

The facts on this whole subject of trance and trancoidal states in the lower animals, may thus be briefly summarized:

First—Trance is a concentration of the nervous activity in some one direction. It is a state of degrees and gradations, all the way from full trance in which there is absolute suspension of the nervous activity in every direction except one, and a corresponding concentration of activity in an exceedingly narrow and limited phase, as in apparent death and long-continued rigidity, and so-called trance coma, to the mildest and most transient dazing and bewilderment.

Trance, as it exists in lower animals, whether quadrupeds, fish or insects, or in forms of life in which the nervous system exists, is the same condition precisely as trance in human beings, and is explained by the same theory,

Through the whole range of phenomena, it is obedient to the same natural law, and which is now no longer mysterious. It is explained as satisfactorily as any of the great laws of nature are explained, certainly as any in the domain of biology.

The state of trance has indeed, in many of its aspects, already obtained the predictable stage—the last and best test of the organization of any science, where we can tell beforehand what will happen with almost, in many instances, unfailing certainty.

Secondly—The only difference between the milder trancoidal states so often observed in animals and in men, as in cases of intellectual absent-mindedness and the temporary loss of presence of mind, and the full trance in which the animal or person is absolutely unconscious for minutes, or hours, or days, or sometimes years, is a difference of degree rather than of kind; and there can be no scientific study of this subject which fails to recognize this fact.

These trancoidal states bear much the same relation to full trance that epileptiform and neurasthenic or neurasthenoidal states or insanoidal states bear to epilepsy or neurasthenia or insanity.

Thirdly.—The methods or processes of inducing trance and trancoidal states in the lower animals and in man are infinite, and there is no one of those methods that are best known that can be said to have any special or pre-eminent virtue over any other, except of convenience and degree.

The philosophy in all these processes and manœuvres is to so alter the nervous equilibrium as to produce concentration of the nervous forces in some one direction, with corresponding cessation of nervous activity in other directions, and this can be accomplished by acting on the nerves of general sensation, or by any of the special senses, or by several of these modes combined; and these purely physical processes may also be reinforced by psychological or mental processes; as when, for example, we act in any way upon the emotion of fear. Effects the most speedy and most powerful are obtained when we combine the excitation of the nerves of general sensation or of special sense with profound excitation of emotion of fear and induction of physical helplessness; as when a horse is cast on his side so that it is impossible for him to rise, or a hen is securely tied by the feet, and at the same time the emotions of fear are energetically acted upon, and the nerves of sensation are affected by manipulation and by gazing into the eyes. The simple excitation of the emotion of fear, is itself, without any physical accessories, the most powerful of any single exciting cause in animals or in men. When, for example, a horse is in a stable that has caught fire, he is unable to move; he is in a condition of trance, and the paralysis of motion which makes him burn to death rather than escape, is one of the symptoms of the trance thus induced.

The temporary paralysis of a horse unable to cross a track or move in any direction when a train of cars is approaching, illustrates the same principle. Human beings, when surprised in the same way, as when an alarm of fire takes place in a crowded building, are likewise entranced, and exhibit the same phenomena.

When theatres are burned, as in Brooklyn a few years ago, and very lately in Nice, with great loss of life, the audiences are largely entranced through the emotion of fear, reinforced by their helplessness; and those who die are unconscious before they meet a painless instead of a painful death.

Of the special senses, that of sight is decidedly the best to act upon in order to induce the trance or trancoidal state. All the other senses may be similarly utilized; the hearing, as when the animal listens to music, or to any monotonous sound, as the falling of water, or the frequent ticking of a clock or watch; the sense of smell, as when some powerful and agreeable odor is near to the nostrils.

All these experiments apply with equal force to the higher as well as to the lower animals.

Fourth—Trance induced by any of the numberless processes above described is but a part of and is obedient to the same law as all the other varieties of trance, including those which appear spontaneously, or through any physical or mental excitation whatsoever, as epileptic trance, alcoholic trance, somnambulistic trance, cataleptic trance, ecstatic trance. To study induced trance in animals, as distinguished from induced trance in man, or to study induced trance in man or animals apart from the general generic subject of trance, is unphilosophical, and has led, and is leading still, to confusion without limit among those who are investigating this subject at home and abroad.

The erroneous, and misleading, and self-contradictory terms that have been applied to this condition, such as "hypnotism," "Braidism," "somnambulism," "catalepsy," &c., &c., should, as rapidly as possible, be driven from the scientific literature of the subject, and relegated exclusively to the possession of non-experts and delusionists.

GEORGE M. BEARD, A.M., M.D.

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ART. IX.—IRIDO-CHOROIDITIS, COMMONLY CALLED MOON BLINDNESS, IN THE HORSE.

VETERINARY science in ancient times received a dignity, not only from being practiced by the most celebrated of Latin poets, Virgil, but by being patronized by an emperor whose reign aided the cultivation of useful knowledge and the exertions of genius, considering them as the principal ornaments of his power. The horse being the most useful of all animals, and held in high regard by the people of olden time, it is no wonder that we find in their early writings descriptions of the various diseases to which it was subject.

The disease of which we are to speak seems to have attracted attention in very early times, and although not as old as the moon, dates nearly as far back. Moon-eye, or lunatic-eye, seems to have been the first name applied to this disease, from the prevailing opinion that the affection increased or decreased with the course of the moon, the eyes being muddy at the full moon, and at the new clearing up again. The blindness in these cases was not due to the direct lunar influence upon the eyes, but supposed to be due to some subtle influence on the system at large.

This notion of the old writers of the influence of the moon, is widespread, and not confined to horses, as we well know insane persons were called lunatic on the same ground.

Specific ophthalmia seems to have been the next name given, the belief having obtained that the disease was due to a specific virus acting in the system. Others called it constitutional ophthalmia, claiming that it was a disease of the general system, with a local manifestation in the eyes. Fearon, considering that gout was the primary cause, named it gouty ophthalmia. Sewell, of England, believing it arose from dentition, called it odontalgic ophthalmia; then, from its occurring at intervals, Percivall called it periodic ophthalmia. This last name has been used of late years more than the others. It is also a better name, yet is open to the objection that it conveys the impression of periodicity, which is not the fact. The disease is one continuous affair with exacerbations, slowly and surely progressing until the final cataract is produced.

This fact may be doubted, but can be proven by the use of the ophthalmoscope. When, to all appearances, the exterior of the eye is well, this instrument will show active inflammation of the interior, viz., choroiditis, etc. I would suggest as a name, irido-choroiditis, as the iris and choroid are the tissues principally involved.

Etiology.—Very many cases have been given by writers both of ancient and modern days, and still we are groping for the true light. All have, however, agreed that the moon has no influence in producing it, and that the name, "moon blindness," should be expunged from the nomenclature. There is no doubt that hereditary influence plays an important part in the causation, a fact noticed by the first writers. Taquetus says (1727), "This is an hereditary distemper, and therefore great care must be taken to *chuse* stallions that have good eyes." Marrimpoey,* considers this cause a very potent factor, and brings many facts to prove it, showing that stallions affected with blindness from this disease produce progeny almost invariably blind. This same fact has also been noticed by others, and in Ireland the prevalence of this disease is so accounted for. We have no doubt that in the majority of instances this is the primary cause, and all that is needed is an exciting cause to bring on the disease.

Rapid change of food has by very many been considered an exciting cause. It has been noticed in Lucerne, Switzerland, that horses pastured on the mountains, where the provender is poor and scanty, the disease does not exist; but in the valleys, where the pasture is abundant and luxuriant, it is quite common even in horses not stalled The same conditions of plethora from over-feeding may give rise to it in horses constantly stalled. Gibson, one of the oldest writers, considers that in chewing oats "the muscles about the eyes are so strained that a defluction of rheum, or more blood than necessary is drawn towards the eyes by the motion aforesaid;" and suggests that the oats be stamped or ground. It has also frequently been found to occur after long-continued or repeated attacks of diabetes, which is often produced by feeding on mow-burnt or kiln-dried oats. This was noticed especially in 1816, when the British army was in France, when large numbers of horses were attacked with diabetes, with subsequent eye trouble. We have seen cases which seemed to have diabetes as an exciting cause. In the human subject we frequently find changes in the eye from this disease; cataract often, retinitis more rarely. The altered condition of the blood, due to the large loss of water, has much to do with this. It has been found to supervene on "grease," exhaustion from severe hæmorrhage, over-driving, hereditary influence as the primary, and any condition that depresses the system as the exciting cause.

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* "Receuil de Medical Veterinaire," 1829.

Pathology.—Gibson, an old writer, says that moon blindness is due to "an obstinate stagnation in the small vessels of the tunica adnata, or white of the eye, and a relaxation of the small kernels that are seated at each of the angles of the eye; that the corrosiveness of the matter destroys the transparency of the cornea, so as to cause blindness." This, Bracken (1767) considers a very lame description of the distemper. This author is the first, so far as known, to call the disease by its proper name, and to appreciate the part of the eye involved, he named it *iritis.* Many years afterward, Pritchard again reminds the profession that the iris is the tissue primarily affected. Examinations of eyes, both in the acute and in the last stages of this disease, have been made. D'Arborval, in many cases, found, on making a section of the eye, absence of anterior chamber, adhesions of iris to lens, atrophy of iris fibres, in some instances bony deposits, the lens shrunken, and in most cases opaque; the vitreous changed to a citron color, and striated, being more fluid than normal. Hemmorrhages between choroid and selerotic are often found, except beneath that portion of the choroid called the tapetum-lucidum. An instance is recorded where the entire choroid was ossified, forming a bony cup. In some cases the optic nerve has been found atrophic. Other observers have noticed the same lesions, viz., those of irido-choroiditis. Excavation of the optic disc has never been observed.

Symptoms.—" Now they be called moon-eyes," says the old writer, Markham; "because, if the farrier do observe them, he shall perceive that at some times of the moon the horse will see very prettily, and at some times not at all. Now, the signs thereof are, when the horse's eyes are at the best they will look rather yellowish and dimme, and when at the worst they will look red, fiery and angry."

The symptoms differ with the stage of the disease and the severity of the attack; but taking a case in the beginning, one will usually get the following history:

Either the horse has had a slight intolerance of light for a day or two, or else none whatever, being apparently well stabled.

In the morning one eye will be found to be inflamed very much; the lids hot and swollen, great fear of light, increased secretion of tears, conjunctiva of lid reddened, nictitating membrane swollen and thrust forward to protect the eye from light, the eyeball retracted in orbit by posterior rectus.

On opening the lids the cornea will be found in some cases clear, in others hazy. When corneal trouble exists, it is of the interstitial variety; the iris, in most cases, loses its lustre; the pupil is sluggish or contracted; in many cases hypopion will be found in considerable quantity.

In severe cases the pupillary space is filled with lymph, the corpora nigra or soot-balls swollen, the whole eye having the appearance of violent iritis.

In milder cases the symptoms come on quickly. We find the same condition of the pupil, either sluggish or adherent, without any exudation in the anterior chamber. Ophthalmoscopic examination of the eye at such time will show large numbers of floating bodies in the vitreous, and in some instances patches of exudation in the choroid.

We have frequently seen the above appearances. The photophobia and acute inflammation may continue from one to four weeks, gradually subsiding; the eye remaining, however, sensitive to light after all external evidences of disease have disappeared.

The horse is now considered by the owner well, and is used in the ordinary way.

In a period ranging from one to six months, the same train of acute symptoms reappear, usually in a more violent manner than at first; this inflammation gradually subsides only to recur in the course of a few weeks, or perchance months. The outbreaks of active trouble come closer and closer together, until blindness closes the attack; cataract being the final result.

We have watched cases during the stage of quiescence (when it was formerly supposed no disease existed), and with the ophthalmoscope have seen the choroiditis and vitreous changes in active progress, showing conclusively that it is continuous, and not periodic in the sense previously understood.

It is, in fact, an irido-chorciditis with exacerbations, resulting in cataract. After blindness occurs in one eye, the fellow eye usually becomes inflamed, following the same course as the first.

Some escape with only one blind eye, but the majority become diseased in both. We suggest as the cause of the disease in the fellow eye, sympathetic irritation through the ciliary nerves by reflex action, which fact now rests on a real and physiological basis, as recently confirmed by Mooren* and Rumpf.

The period during which the disease continues varies from three months to two years.

Many old writers were of the opinion that "wall-eyed" horses were exempt, but this has been found to be incorrect. Most all agree that the small sunken eye, technically called "pig-eye," is particularly liable; this may be accounted for in part by the fact that these are usually animals of feeble constitution. This disease is rarely found under four years, commonly between four and eight, rarely after, seeming to have a preference for the age of maturity. It is quite rare in Spain and Portugal, in considerable amount in England, France, and the United States, and very common in Ireland. Its frequency in the latter country is probably due to the impoverished condition of their animals and their poor stable facilities.

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* Centralblatt für de Med. Wissenschaft, Nr. 18, 1880.

The *differential diagnosis* between this and catarrhal conjunctivitis at the onset, is necessary, and may be determined by the following points:

In conjunctivitis the patient usually has a general catarrh of the nasal mucous membrane; the symptoms come on gradually, and in *both* eyes; the secretion is mucus, the iris has its normal lustre, and the pupil acts. In the other disease the attack is sudden, in one eye only, the secretion only tears; the iris is sluggish or adherent, with some general febrile disturbance. The prognosis is very unfavorable.

Treatment.—The old works on farriery are full of methods of treatment, many of which are very novel and interesting.

Braken advises the following prescription:

Venice turpentine, three ounces.
Living millipedes, ½ gill.

The millipedes are to be bruised and mixed with the turpentine, of which a mass is to be made by mixing with flowers of brimstone; out of this balls are to be made, and one given daily.

Ligature of the temporal artery has been advised, and by many old writers practiced. After a great array of prescriptions, Bracken has the frankness to confess that, had he a horse with this disease, he would not wait to try any of his methods, but first get rid of the animal.

This is, perhaps, the wisest thing to do. The treatment is very unsatisfactory, and it is doubtful whether very much can be done. We would suggest the following treatment as being the most rational:

When the eye is first attacked, the inflammation just beginning, the great object is to dilate the pupil so that no adhesions between the iris and lens will take place. This is accomplished best by sulphate of atropia, gr. 2 to 4, to an ounce of distilled water. This solution should be dropped into the eye four times a day.

The atropia relieves pain as well as having an action on the pupil.

To promote the absorption of the lymph and pus in the anterior chamber, and the infiltration of the cornea which often happens, the best thing is the application of warm water, bathing the eye one half-hour three times a day.

Where the hypopyon is very great and does not yield to the hot water, paracentesis of the cornea may be done, thus allowing the pus to escape, and at the same time diminishing the tension of the eye. Leeching may be resorted to in severe cases.

Febrile disturbance of the system must be treated in the usual manner.

A case is on record where accidentally a lancet was thrust through the cornea into the anterior chamber, the aqueous humor escaping; the eye immediately improved, and never became attacked subsequently.

We would advise the paracentesis to be tried; for the escape of exudation will certainly improve the eye, if it will not do permanent good.

Internally, we would advise the administration of iodide of potassium in moderate doses (gr. xl. t. i. d.), mixed with the food, together with the use of mercury, either by inunction or by the mouth; this latter drug to be continued till the gums are "touched."

The object of this internal treatment is to arrest, if possible, the choroiditis and other changes in the interior of the eye. When the inflammation has left the exterior of the eye, the atropine may be discontinued unless adhesion of the iris exist.

The internal medication should be continued as long as the floating bodies in the vitreous remain, stopping the medicine should there be an intolerance of the drug. We have watched several cases in which this plan of treatment was adopted, the ultimate result being very good.

This treatment will do much for this affection if adopted in the first attack, but promises less and less, the more chronic the disease.

In any case where the diseased eye is causing sympathetic irritation of the fellow, as shown by photophobia, redness, and inactivity of the pupil, it is advisable to perform the operation on the diseased eye called optico-ciliary neurectomy, which consists in thoroughly dividing the optic nerve, and especially the ciliary nerves which enter around it. This may be done and the eye-ball left in situ. This has been done on the human eye for this purpose with good effect. It will certainly do no harm, and may prevent the disease causing blindness in the fellow eye. Some old writers speak of persons, who, "put out one eye to save the other;" they, however, simply opened the eye and caused the evacuation of its contents, leaving the optic and ciliary nerves intact.

Notwithstanding our best endeavors, many cases will terminate in blindness.

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Since 1840, very little new material has been added to the literature of the subject.

ART. X.—VETERINARY HYGIENE, AND THE NEW YORK CITY STABLES.

NO. II.

THE confinement of city horses and cows is so unnatural and severe, that, with the best sanitary conditions, their lives must be far short of those having more liberty. The labor lives of road horses in the city reaches about six and a half years; livery horses, six years; truck horses, owned by drivers, eight years; stage horses last seven years; express horses, seven and a half years; car horses, four and a half years only; while farm horses, driven by the owners, average twelve years of labor life.

Every horse requires 1,062 cubic feet of pure air every day to maintain perfect health; but in bad stables the air is vitiated, and the horse breathes in these poisons ten times every minute, with a rapid and certain vitiation of his blood, which completes its circuit every twenty seconds, thus shortening his life at every respiration. If man requires 800 cubic feet of air space, the horse requires at least 5,000 cubic feet.

An important factor in the life of the city horse is the temperature in the stable; for at rest he has two degrees less temperature than at liberty. He will suffer less at rest in a temperature too high, with plenty of pure air, than in a temperature too low; for the required temperature must be secured at the expense of food and air.

It is extremely rare for a city horse to breathe pure air in the stable, and he suffers in common with *human citizens* from vitiated and poisonous air in the streets. At his daily toil the horse breathes rapidly, and all of his physical functions are stimulated to the highest degree. His blood is rapidly poisoned by the foul air of the city streets, and by disease germs floating in every dust-cloud that daily sweeps through the city in dry weather.

After a day of severe and exhausting toil, the city horse is brought into a cold, dark, damp stable, having a wooden floor, reeking in filth, and emitting foul odors; he is fed on poor, musty hay and hard, dry grain, and too often of bad quality, and his thoughtless owner wonders when he finds his faithful horse unfit for six days' toil a week, and a long and rapid drive on Sunday.

In the vile stables of New York, Mr. Henry Bergh can find more *cruelty to animals* than is ever exhibited in the streets in broad daylight by the most depraved wretches who abuse dumb brutes.

Wood is unfit for stable floors, because of its drying and heating nature to the delicate textures of the horse's feet, and its capability to absorb and retain offensive and decomposing matters in the urine.

Brick laid on edge on sand, and cemented in by melted asphalt, makes an impervious, cleanly, and cool flooring for stables, which can be kept free from ammoniacal odor and decomposition by being daily sprinkled with a few pounds of ground plaster—sulphate of lime—and littered at night with clean straw. The stables thus treated remain sweet, and the litter can be used twice the period of that handled in the usual way. It is essentially important to care for the horse's feet; for they are the first and chief seat of disease, and lameness the most common cause of injury and impaired usefulness.

Cleanliness in the stables, and frequent removal of manure, and disinfection of the manure vaults, prevent flies from tormenting stabled horses in warm weather. The *stomoxys calcitrans* lays its eggs in the warm, fermenting manure, and hatches in large numbers. This fly is a tormenting blood-sucker, and greatly annoys horses, and especially such as a bad fashion has deprived of its natural defence, by cutting the long flowing tail into a short stub, utterly powerless to drive flies from the defenceless brute. This insect, in the pupal state, is the common manure maggot.

Lime and carbolic acid destroy both the eggs and the maggots; but cleanliness is the preventive measure of greatest value.

Flies are driven out of stables by hanging up bunches of plantain leaves previously dipped in milk. A decoction of ergot sprinkled about the stables will also destroy flies. Thin-skinned horses suffer intensely, losing in condition by the painful stings of flies. This may be prevented by moistening the horse-brush in a decoction of walnut-leaves, and slightly moistening the coat after the morning grooming. Washing the horse's legs and feet in a solution of borax will prevent the annoyance from flies. But the full tail is a horse's natural defence against them. The man who bangs his horse's tail in the summer is a fit subject for prosecution by the Society for the Prevention of Cruelty to Animals.

City cow stables are generally filthy; their management is filthy; the people are filthy; the pails, pans, cans, strainers, &c., &c., are extremely filthy. Filth is the soil for the growth and incubation of disease germs. In the unbuilt-up lots and breathing-places for citizens are located the city cow stables, contaminating and vitiating the atmosphere for blocks in every direction. The wind may be fickle in bearing odors in excess at times; but the stench from city cow stables is never-failing, is disgustingly constant, spreading disease and death to those who seek pure air in the suburbs.

From the Battery to Harlem river, and from the Hudson to East river, there is now little enough pure air for human beings to breathe, without dividing it, and poisoning it with useless animals, emitting offensive and baneful odors. Mechanics must yet achieve the application of unobjectionable motor power, which shall run our street cars, move our merchandize, and handle our commodities with the least possible aid from horses. Such appliances would add vastly to the sanitary condition of New York, and other large and crowded cities. All horse stables should possess every sanitary arrangement; and cow stables are unnecessary and unwarrantable nuisances, that should be abated by Boards of Health.

City stables should be built in special localities, where, congregated together, every sanitary provision may be made to secure cleanliness and freedom from every kind of offence; and where repeated inspection shall secure and maintain the health of the city. In this way the animals stabled in them may be kept in a healthy condition, and the proximity of stables to residences may, and should be, prohibited.

The sanitary condition of the stabling of 7,000,000 of horses, and the 4,000,000 of cows in the State of New York, would add many millions of dollars to the value of these properties in improvement and saving. Could this benefit extend to the care and protection of the 600,000,000 of horses, and to the 300,000,000 of cows, and also to the 1,000,000,000 of cattle in the United States, it would raise the price of cattle from the low average of $20 per head to at least $25 or $30; and would raise the average price of horses from $58 to $75 per head, making an enormous grand total of added wealth to the country.

Perfect sanitary city stables would secure a marvellous decline of the mortality of our citizens from nearly two hundred per day, to the lowest death rate of the most civilized city of Europe.

The number of city-kept cows is decreasing in New York year by year, though it is difficult to secure pure milk for our two millions of citizens and visitors from the best rural sections within a radius of one hundred miles. It is certainly more than doubtful propriety to attempt to produce milk, within the densely populated city, from city-fed and city-stabled cows. There is an error in the minds of many citizens, that milk is pure and good as it comes from the cow near by, and unwatered—always from the same cow. The fact is, that good material, in the shape of sound food, pure water, exercise, light, air, and all sanitary surroundings, are the important elements in the production of sweet, healthy, and sound milk. The milk of city-stabled cows is more or less dangerous, from the fact that it often contains tuberculous matter from the phthisis in the cow, produced by unsanitary conditions. Feeble young children consuming tuberculous milk, suffer from diarrhœa; and if long fed upon it, die of consumption. Tuberculosis in the city cow is common, as the result of confinement in dark, damp, filthy stables, and of its being fed on bad food.

ALLEN S. HEATH, M.D.,
Professor of Cattle, Sheep, and Swine Practice,
Columbia Veterinary College
and School of Comparative Medicine.

Art. XI.—POSTERIOR PARALYSIS IN MULES, FROM ENTOZOA IN THE KIDNEYS.

The following case of paralysis of the hind extremities of a large number of mules, arising from entozoa within the pelvis of the kidney, may prove of interest to some of your readers. The reason I have not published it before will be apparent to the reader as he proceeds.

A stock-raiser, residing about fifty miles from Cincinnati, called upon me some time ago in reference to a disease that was carrying off his mules in a very rapid manner.

His stock of mules, at the time he called upon me, amounted to about forty head, of two or three years old, and previous to this he had lost about nineteen or twenty.

He informed me that the mules which had died were affected in a very peculiar manner, and that all presented the same symptoms. The first noticeable symptom was an unsteady gait when walking, which gradually increased, until, when the patient lay down, he was unable to rise again, having lost the entire power of the hinder extremities, from the fact of their having become paralyzed.

Notwithstanding all this, their appetite appeared as good as when in perfect health. The owner informed me that their principal food was corn fodder, and as they lay on the ground appeared to enjoy their food immensely, although unable to walk. He furthermore informed me that some time ago a difficulty had arisen between himself and the owner of the farm adjoining his, in consequence of which they were at swords' points with each other, and in consequence of his neighbor also having a large number of mules, none of which had displayed any of the fatal symptoms; and taking into consideration the feud which had been existing between themselves for so long, it very naturally ocurred to the owner of the diseased animals that his neighbor was the sole cause of his misfortune, and that he had resorted to poison in order to be revenged on his enemy.

He at once consulted two able lawyers, stating the case in full; and so convinced were they of the guilt of the neighbor, that they at once entered suit, placing the damages at ten thousand dollars. After suit had been entered, it occurred to the legal gentlemen that a post-mortem examination would be next in order, and as there was no competent veterinarian in the neighborhood, two gentlemen of the medical profession were employed to make the autopsy. The conclusion from their examinations was, that the mules had been poisoned. The counsel for plaintiff was not, however, satisfied, and thought it would be better to have an examination by a veterinary surgeon, in consequence of which the owner called upon me, and requested that I would come to the farm and make another examination. On the following day I boarded the train and arrived at the farm at about seven P.M., too late, however, for business, so I concluded to postpone the examination until the following morning.

When morning came we proceeded to the barn where the mules were feeding, and the first thing I noticed was a number of the animals lying around the yard, feeding as though nothing was wrong with them; but on trying to make them rise, I found they were unable to use the hinder extremities.

I next selected the mule that appeared to me to be the worst affected, and with a blow from a hammer slaughtered him. I then carefully examined the various organs in order to discover the poisoning as described by the two physicians, but could find no such conditions present. After having examined the thoracic and abdominal viscera, I was about closing my examination, when it occurred to me that one kidney was absent; that is, there was so little remaining as to constitute little more than what would form the pelvis of the organ that should have been present; in fact, nothing more than a fatty-looking substance about the size of a hen's egg. I carefully removed it, taking care to dissect out a portion of the ureter, which I laid aside. I then removed the fellow member, which presented a natural appearance as regards size, and this I also laid aside.

I next took the atrophied kidney, and by a stroke of the scalpel laid it open, when I discovered the pelvis swarming with entozoa, some of which were so minute that they had penetrated far into the ureter.

The fellow kidney was next examined, and found to be affected in like manner, but not to the same extent.

I then selected a second mule, the one which appeared to be the farthest advanced in the disease, and slaughtered him in the same manner as number one. In this case I found both kidneys considerably atrophied and containing a large number of the entozoa.

Mule number three was next slaughtered, being unable to rise; very similar conditions were presented in this case; each kidney, however, seemed to swarm with the entozoa, which were extremely small, presenting the appearance of a fine darning-needle.

I now concluded that my investigation had been pushed far enough to convince the greatest skeptic that the poisoning, as stated by the medical gentlemen, was purely imaginary. Here was positive evidence that the loss of power was entirely owing to the presence of a collection of parasites within the pelvis of the kidneys, producing atrophy of those organs, and resulting in paralysis of the hind extremities. The owner and several other gentlemen were perfectly satisfied as to the cause of the disease, and on the case being stated to his legal adviser, they at once withdrew the suite, without informing the defendant why or wherefore, and there it ended. At the request of the owner of the mules, I kept it out of print; the reason why must be obvious to every reader. I took the best specimen home with me, and on carefully examining the entozoa, found they belonged to the class known as the *Strongylus;* but never having met with a similar case, and wherein the conditions were so much alike in each subject, I thought it might possibly be of interest to some of your readers, who are liberal enough to acknowledge that there are many things yet to learn, even in the veterinary schools.

I would also state that I placed the balance of the mules under a course of treatment, which consisted of small doses of hydrochloric acid largely diluted with water, twice a day. A gradual improvement was observable from the time I commenced to use it, and the entire drove of mules was restored to apparent health.

CINCINNATI. Feb. 26, 1881.

G. M. BOWLER, M.D., V.S.

EDITORIAL DEPARTMENT.

GOVERNMENT AND THE INVESTIGATION OF CONTAGIOUS DISEASES AMONG DOMESTIC ANIMALS.

AT this moment the whole country has been awakened by alarming reports, to the effect that disease is rife among some of our most important food-producing animals, and the immediate results appear to be that American pork has been interdicted in France, Germany, Russia, Spain, Italy, and Greece, while other countries are on the point of adopting similar measures. When one thinks that the export values of hogs and their products amounts to over $100,000,000 annually, the importance of the matter to the country at large becomes apparent.

Let us see what steps the general Government has been taking in this and similar directions to give confidence that she exercises a proper supervision over the healthfulness of her exports, or indeed, that she has any useful information that is at the service of her citizens. We turn to the Annual Report of the Commissioner of Agriculture, which bears the imprint of 1880, and presumably gives us the result of all the latest inquiries garnered by the Government officials in their various capacities.

Evidently, hog cholera, our *tête noire* at present, has attracted the most attention, for we find that it consumes ninety pages out of the 268 of the little volume. The *piece de resistance* on this topic is clearly the report of Dr. H. J. Detmers, though, in the words of the introductory preface, it "contains few additional symptoms worthy of mention." Nor did thirty additional *post-mortem* examinations "reveal any new morbid changes worthy of mention." Dr. Detmers, whose work in other directions has entitled him to more than the usual attention accorded a veterinarian of the present epoch in this country, gives a brief review of such facts as are generally known, and then details the results of some special experiments. It is quite evident that he is glad to deal with the microscopic origin of the disease, and the frequency with which he finds the *bacillus suis* in his morbid materials, shows that he has imbibed the zeal of a Hallier, Pasteur, or Salisbury. Unfortunately his drawings do not convey to one's mind the impression that he has dealt with anything but rather wrinkled or bloated specimens of the ordinary bacteria, which he might, perhaps, have found in other places than in the lungs or intestines of hogs, had he thought of looking for them.

Dr. James Law follows in a report which is characterized by the discriminating judgment which makes this observer well fitted to assume the fascinating but dangerous role of an investigator. His experiments in the conveyance of the disease to the sheep and rat, and then the final re-inoculation of the morbid product upon the healthy pig, show a truly scientific acumen, and we may expect from his work some results of definite value. In this direction, certainly, the Government should push investigations with the utmost rigor; for if a modified virus can be obtained that will produce the disease in a less intense form, which will not affect the general health of the animal, and yet grant him immunity from a second attack, we shall have made a discovery that will rank with that of vaccination.

Returning from the reading of this short but suggestive article to take up the next in order, we fairly open our eyes with astonishment, and wonder what next will creep into a government report.

This author, too, is a microscopist, and he plunges at once into the bottom of his subject.

Let us quote him: "With from one to three hundred diameters I find a dark and nucleated cell or cells, with dark outlines and a dark centre. The cell appears circular at first, but in its different stages of aggregation or fermentation it assumes an egg-shape from the piling of one upon another; or a better comparison, perhaps, would be that of a cauliflower or head of curled lettuce.

The tissues of these cells appear ecchymosed." This author has evidently framed his mind to have a theory which shall at least have the merit of originality, and, he adds, naively enough, that his "observations so far overturn the received opinions of this disease."

It is wearisome to criticize a book of which the best has already been written. However, since it must be done, a report follows by Dr. D. E. Salomon, which adds nothing to the subject of splenic fever (Southern cattle fever), but is at great pains to reaffirm or restate certain pathological theories which date back more than a dozen years, and never had any acceptance except from those visionary philosophers that are ready to accept any theory the moment it sees the light.

It is needless to say to those who are informed of these and kindred matters, that the *coniothecium stilesianum* is not currently supposed to cause splenic fever, nor did Billings and Curtis find it when employed by the government to look into the matter.

In the remainder of the volume we find a review of Prof. Leur's book on pleuro-pneumonia, an article on rinderpest, which, by the way, has never yet appeared in this country, so that it can hardly be regarded as of prime importance just now to the farmer or stock breeder; an article on glanders and farcy, that is based on work done nearly twenty years ago, and is taken nearly bodily from a published work; annotations on French experiments; a mass of communications from a few intelligent and a great many illiterate individuals scattered throughout the country, and short items of intelligence, mainly on the diseases of hogs and cattle, from the various States of the Union.

We close the book with positive mortification that a department of the greatest government in the world should publish an official report which contains almost no facts of positive value, though they are manifestly within the reach of intelligent persons; and this in the face of the positive necessity that we should have the information, or else lose the greater part of a trade that has assumed the most colossal proportions, and furnishes support to hundreds of thousands of our citizens.

DOCTORING THROUGH THE NEWSPAPERS. — It is the custom with a number of agricultural papers to have a veterinary department, which is devoted to prescribing for the various diseases of the domestic animals. A farmer's horse or cow, or sheep, or pig is taken sick; he sends on a record of the symptoms to his paper, and it is published in the proper department, with medical advice.

We wish to call the attention of members of the veterinary profession to this practice, and to beg that they use their influence as much as possible to discountenance it. We do not mean to say that it is an utterly bad practice, or that it is not occasionally of considerable help. With the present dearth of well-educated veterinarians, it is perhaps just now a necessity. We do claim, however, that this method is inherently bad. It leads to the habit of forming vague or careless diagnoses. It makes therapeutics a routine, and a hap-hazard affair generally. The advice that is thus given does no good at all, or does harm quite as often as it benefits the patients. It sometimes is simply a glorification of the editor's particular Spavin-cure, or his Inestimable General Horse-drink or Inimitable Silver Blistering Fluid. It should be remembered also that the correspondents who write the symptoms are persons not trained to observe with any care. Their histories of symptoms must necessarily be incomplete or misleading. It is very well known that in human medicine no diagnosis and no medical advice is ever tendered through the medium of medical journals.

Any thoughtful person who looks over the columns of these veterinary departments will soon be convinced of the weakness of the practice. "My pig," says one, "had fits, or something like them; it got better; then it had another, and died. What was the matter?" No wonder the veterinary editor, having torn his shirt in three places in the mental struggle for a diagnosis, writes, "that the pig had colic, or cerebro-spinal meningitis, or intussusception of the bowels, or inflammation all through the brain." And no wonder that in any case he would give it a Condition Powder, follow that up with a general cow-drink, and put a golden blister at the root of the tail.

Now, perhaps in this particular instance the diagnosis and prescription were correct, and the pig got well, if it had not previously died. But the chances are against it, as they always must be when symptoms originally obscure are imperfectly recorded by those who are utterly ignorant of disease.

We repeat, then, that we hope the veterinary profession will look with disfavor against this custom of newspaper practice. It may be necessary for a time, but let its existence be under a protest, and let it be abolished or reduced to a minimum, as soon as possible

We ought to say in this connection, however, that most of the veterinary departments which we have examined seem to be conducted with very good judgment and evidence of veterinary skill. The best is made of a bad method.

ETHICS IN VETERINARY PRACTICE.—It is the custom of some veterinarians to advertise themselves, with much exuberance of language, in various agricultural, sporting, or stock journals.

There is no code in veterinary medicine which directly forbids this, but it is looked down upon by our best practitioners, and justly, as being a thing unworthy of the profession.

We would remind persons who are inclined to do this sort of thing, that it is a practice which, in human medicine, by common consent, stamps the man as a charlatan. Veterinarians, therefore who follow it lay themselves open to the same imputation.

Advertising one's self is, of course, not an actual crime; but there is a rational basis to the feeling of the better men against it. A man who advertises his groceries or dry goods, advertises things which are quite apart from his own individuality. But a person who announces that he is the most skilful of surgeons in Dakota, or the greatest curer of spavins in all New England, or a graduate of more foreign and domestic colleges than anyone else in the United States—such a person thrusts his personality upon the public in a most offensive way. He lauds himself, which is bad, at the expense of his brother, which is worse. There is also very likely to be something in such advertisements which is not strictly true. It is hard to draw the limits when announcing one's own praise. A question of morals, therefore, comes in here. Apart from this, it is perhaps only a question of good and bad taste, of decent modesty or vulgar pretension.

It is a credit to the veterinary profession, after all, that advertising exists as little as it does. We trust it will not increase. Its decline and absence will mark a growth in the scientific standing of veterinary medicine, and in the respect felt for it by its practitioners.

To those who contend for advertising, we would admit this. There may be occasions when the putting a plain card announcement in local journals is justifiable. Itinerancy among veterinary surgeons is at present, at times, almost unavoidable; and for these some card announcement is perhaps allowable.

ENSILAGE AND DISEASE.—The subject of ensilage is now agitating the whole agricultural world. Ensilage is, essentially, corn-fodder, cut up, packed in air-tight pits, and allowed to remain there while it undergoes to some extent the acetic acid (?) fermentation. By this process, it is said that the cost of feeding cattle is reduced from one-half to one-fourth.

The changes produced by ensilage result in keeping the water in the corn and in diminishing the amount of non-nitrogenous matter. In some cases a great acidity of the fodder is produced. Cattle generally eat the new food with great avidity, and it seems to agree with them.

We advise veterinarians, however, to be on the watch. It is said that with every new invention there comes a new disease. This generalization, if ever true, should apply in the case of ensilage, which involves a great change in the diet. We are told that ensilage fodder makes rich milk, and preserves the animal in good condition. But we have yet to see whether it does not eventually produce some digestive or other disturbances; whether it does not affect the flesh, or the productiveness of the animal, or the health of its offspring. Bad effects, indeed, are already being announced by some. It will certainly be an interesting fact if so extensive a modification of diet does not in some way show itself on the animal. And even if cattle are unaffected, it must still be learned whether the horse thrives equally well. A modification of ensilage has for a long time been employed in Germany, but not so extensively as to furnish accurate data for judging upon the merits of the system now being popularized in this country.

CONTRIBUTIONS TO THE JOURNAL OF COMPARATIVE MEDICINE. We shall be glad to receive communications from veterinarians on subjects relating to the diseases of animals. There is a disinclination among many veterinarians to write, even if it is only to report cases. This apathy is a thing which is greatly to be deplored. Nothing assists so much in forming habits of careful observation, and in gaining skill in diagnosis, as the recording of cases. We trust that our subscribers will take the trouble to pay more attention to this subject. Articles need not be long or elaborate. The simple history of cases often furnishes the most instructive and suggestive kind of medical writing.

We have been pleased to find that with each issue of the JOURNAL a larger number of communications has been sent us. We trust that the increase will continue.

REVIEWS.

MANUAL OF CATTLE-FEEDING. By HENRY P. ARMSBY, Ph.D. New York: John Wiley & Son, 1880. 8 vo, pp. 525.

It surely indicates a growing interest in veterinary science in our country that a book of the character which we find this to be should be published. The author has treated his subject in a clear and systematic manner, and he shows a thorough acquaintance with the scientific principles that underlie it. The book is divided into three parts. The first treats of the general laws of animal nutrition. There are chapters upon the composition of the animal body, upon the components of food, upon digestion and resorption, and upon various other topics connected with the digestion of food and its transformations in the body. Especial attention is given to the physiology of the formation of flesh and of fat. The principles upon which a flesh-giving diet and a fat-giving diet should be based are discussed in full. The second part treats of the different kinds of foods. Each one is taken in order, its analysis given, and its comparative digestibility shown. The third part is devoted to the feeding of farm animals. Here we have given, first, feeding standards; then the proper food for oxen, sheep, etc. The variations in this food, in accordance with the amount of work done or the amount of flesh or milk desired, are laid down. A chapter is also devoted to the feeding of growing animals, and another to the calculation of rations.

It will be seen that the subject of cattle-feeding is gone over very completely, and is treated in something more than a merely popular manner. The chemistry of food, the physiology of its digestion, its changes, and the laws which govern the production of flesh, of fat, of heat and of work, are stated briefly, but still with sufficient fulness and clearness. It is a work which can be understood by the man who has not had a medical education. but it is also one which ranks higher than a merely popular feeding manual.

The book meets a decided want in this country, and although a good deal of it is not original, but taken from German works, nevertheless, great credit is due to Dr. Armsby for the careful manner in which he has performed his part.

DE LA LEUCOCYTHÉMIE CHEZ LES ANIMAUX DOMESTIQUE. Par M. ED. NOCARD, Professeur de Clinique a l'Ecole Veterinaire d'Alfort. Paris: Asselin & Cie. 1881.

Leucocythaemia in the Domestic Animals.—In this monograph by Dr. Nocard, we have presented a very complete *resumé* of the whole subject of leucocythæmia. The author reviews the history and pathology of the disease, and then gives an abstract of all the cases which have been reported as occurring in the lower animals. This summary, which is extremely interesting, shows a prevalence of the disease among these animals that is not generally known. He reports nine cases as occurring among horses, six among cows, five among swine, twenty-one among dogs, and one in a cat. The morbid anatomy of the disease in these animals is described. We notice no striking difference, however, between lesions here and those in the human body. The increase of white globules in the blood is in about the same ratio. The spleen and the lymphatic glands and other organs are affected also in the same way. The most frequent lesion is hypertrophy of the spleen, next come the lymphatic glands, and then the liver. The symptoms of the disease are weakness and loss of appetite, sometimes evidences of pain in the left hypochondrium, dyspnœa, hemorrhage from the nose or intestines, loss of flesh, in some cases ascites, and occasionally polyuria. In splenic and in lymphatic leucocythæmia the evidences of the disease are shown by the enlarged glands. Death inevitably results.

The author states that inoculation of the lymphatic products in living animals has been tried without result. This, he says, is one test of its entire distinctness from tuberculosis, with which disease certain authors appear to have confounded it, especially when it affected the lungs.

With reference to treatment, he recommends no specific measure. Iron and tonics and good food will produce some relief. Splenotomy and extirpation of the enlarged lymphatic glands does no good.

VADE MECUM OF EQUINE ANATOMY, for the Use of Advanced Students and Veterinary Surgeons. By A. LIAUTARD, M.D., D.V.S. New York: W. R. Jenkins. 1879.

This work hardly comes up to that of McBride, though it is not entirely without merit.

CASE DEPARTMENT.

COLUMBIA VETERINARY COLLEGE HOSPITAL.

REPORTS OF CASES UNDER CARE OF FRANK WALTON, D. V. S., HOUSE SURGEON.

I.—Amputation of Tongue.—A horse was brought to the hospital January 12th, 1881, for an extensive laceration of the tip of tongue and an almost complete division at the base. Owing to the extent of the anterior wound, it was thought best to excise the anterior two inches of the tongue, and to stitch the posterior laceration together. Five sutures were applied to the posterior wound, which closely approximated its lip. A cord was drawn tightly around the tongue, just posterior to the portion which was to be removed, and the tongue divided with one sweep of the knife. The cord was allowed to remain around the tongue for two hours; no secondary hemorrhage of any extent followed, although there was a little oozing of blood after removing the cord. The animal was nourished with semi-fluid food, and the mouth washed with deodorizing lotions. Both wounds healed rapidly, and the animal was discharged in thirteen days after admission to hospital, cured.

II. —Lacerated Wound of the Neck.—*Previous History.* — The horse was blind. The animal became frightened by the whistling of one of the engines of the elevated road; the driver lost control of the animal, and she dashed into a plate-glass window of a store on the corner of Thirty-seventh street and Second avenue; becoming more frightened, she turned completely around, and dashed into a window on the opposite side of the street before she could be controlled. On admission to the hospital, the animal was suffering from a lacerated wound in the neck midway between the head and shoulders, and extending from above downwards. The wound was thirteen inches long, and was bleeding very freely. The wound contained many fragments of glass. Several small arteries were ligated, all the particles of glass removed, the wound dressed, and the capillary oozing arrested by cold and mild astringents. The following morning the wound was carefully examined and found even more extensive under the skin than upon the surface. There was some laceration of the muscles above and anterior to the external wound. The wound was four inches deep, having penetrated some of the muscles; there was also extensive laceration of the soft parts under the skin for six or seven inches posterior to and below the open wound. A counter opening was made through the most dependent part of this pocket, and a perforated drainage-tube introduced through this counter opening and brought out at the last point of the wound, thus establishing a complete and free drainage. The original wound closed by interrupted sutures. The wound was then thoroughly washed out with a solution of carbolic acid (1 to 40). A side line was then attached to the bit and ring of the surcingle to the same side as the wound, to prevent the horse throwing the head to the opposite side, and thus increasing the tension on the sutures. The wound was thoroughly washed out twice a day with carbolic acid solution. Very little swelling followed, and the wound healed very rapidly. The drainage-tube was removed on the tenth day, and the animal returned to the owner with positive instructions to keep the side line on a few days longer. Failing to do so, one edge of the wound was torn open, but healed in a few days by granulating from the bottom. The final result was all that could be desired.

III.—Abscess of Hip.—On February 22d a horse was brought to the hospital for lameness of the right posterior extremity, with the history that he had bruised the ham of that side in pushing through a narrow alley-way. On examination, a large swelling was noticed over the right acetabulum, extending over considerable territory. Upon palpation, fluctuation was detected; the tumor was aspirated, and found to contain pus, and an abscess was diagnosticated. An incision was made into the abscess two inches behind the trochanter of the femur, which seemed to be the most dependent portion. There was a free discharge of pus and a rapid disappearance of the swelling. A probe was introduced into the cavity, and it was found to have extended nearly up to the most prominent portion of the hip. Free drainage was established by two counter openings and the introduction of setons. The wounds were carefully cleansed by carbolic acid solution (1 to 40). The abscess healed rapidly, and on March 8th the animal was discharged, cured.

IV.—CYSTIC CHANGE IN THE MUCOUS MEMBRANE OF THE STOMACH OF A HORSE.

Editor Journal of Comparative Medicine:—

In October, 1878, I was called to see a sorrel mare, aged sixteen, and said to have colic. On arriving at the "*Forest House Stables*," I found my patient lying outside, where they had led her to die. After noting the symptoms and examining the case, I requested her history, which ran somewhat as follows:

She had been turned out to pasture in June, because of these spells when worked.

She showed no signs of illness when at pasture. These attacks had continued for two years, during which time she had raised a colt. The night previous she was taken from pasture and fed on new corn, with an allowance of hay. The next morning she received oats, and was then harnessed and driven to this city, a distance of nine miles. When within one-half mile of town she began to perspire profusely, and showed a disposition to lie down, but by aid of the whip was forced to her destination, where I saw her about one hour after her arrival.

Believing the case hopeless, I requested that she be killed; but before my orders could be carried out, she died.

The symptoms did not vary materially from those usually presented in gastric impaction at an advanced stage.

Post-mortem.—Unable to conduct this myself, it was left to the *knacker*, who related the following: On opening the abdominal cavity, the small intestines were noticed to have a slight blush, that of the duodenum being more extensive, and approaching inflammation, while the stomach at the pylorus was extremely friable. On opening this organ and removing its contents, he saw a cluster of grape-like sacs, as if strung together, and numbering some twenty or thirty independent cysts. They were removed, with a portion of the muscular walls of the stomach, and brought to me for inspection.

The mass was situated anterior to the pyloric ring in the right or lesser cul-de-sac, and hung suspended by a continuation of the mucous membrane, which was much thickened; this abnormal growth acting in time of chymification as a valve to the pyloric ring, rendering further digestion impossible.

These cysts varied in size from a hickory nut to a large hen's-egg, and when opened by the knife, there exuded a semi-gelatinous fluid resembling mucilage; its walls were about one-eighth of an inch in thickness.

P. S.—Will the Editor of the JOURNAL be kind enough to state whether such has been found in any other organ than the *uterus?* I called several physicians' attention to it here, but none were able to say; but pronounced it a hydatid.

Very respectfully,

SCRANTON, Pa. L. E. WHEAT, V.S.

[EDITORIAL NOTE.—The large number and size of the gastric tumors in this interesting case of Dr. Wheat makes the account a valuable one, and it deserves to be placed on record. In the absence of similar data from the field of veterinary medicine, one naturally turns to human diseases, which appear to furnish the required information. Polypoid excrescences, varying in size, are sometimes found in the human stomach, according to Klebs and Leube, and a very detailed account has been given by Virchow in his famous work (Die Krankhaften Geschutste, i. s., 248) of a case where they were found in the intestines.

It would appear that the gastric or intestinal follicles may undergo a mucoid change, and increase greatly in size, so that in fact they cannot remain in the gastric walls, and are expelled by muscular action. A certain amount of gastritis is usually associated with such polypi, and there is a corresponding thickening of all the coats, which in all probability is one of the earliest changes.]

V.—HEMIPLEGIA FOLLOWING INFLUENZA, IN A HORSE.

EDITOR JOURNAL OF COMPARATIVE MEDICINE:—

As correspondence and communications are invited from members of the profession, and especially from those who contribute towards the support of your excellent journal, I have to offer your readers a case which occurred in my practice in this city, which was attended with considerable interest to me, and may be, to others.

In the spring of 1880 I was called to see a case reported to be distemper. On approaching the animal, the peculiar appearance of the head struck me at once. Pulse fifty-two, respiration slightly increased; auscultation revealed slight bronchitis. There was a discharge from left nostril, which was sticky and glutinous, much resembling glanders, and adhering around the edge of the nostril. The submaxillary glands were slightly enlarged; bowels somewhat constipated; urine high colored. The ear, eyelid, and all of the nostril of the left side were drooped; the tongue protruding from the side of the mouth; pupil slightly dilated; deglutition was not apparently much affected, but the animal found much difficulty in masticating its food, taking it in its mouth and rolling it out again. Although the animal managed to swallow some, my diagnosis, after examination, was hemiplegia, concomitant with influenza. I had the animal brought out, though with difficulty. It was rather ludicrous to see him walking "side on;" when urged to trot, he fell, and only rose with great difficulty.

I could assign no cause why this lesion should have occurred, save that he had been worked hard at the outset of the disease.

Treatment.—Gave half-pint doses of linseed oil until bowels became relaxed, being afraid to give a purgative on account of respiratory organs being affected; rubbed strong ammonia liniment along the course of the spine. Administered potass. iod. in two drachm doses twice a day, which was given for three weeks. At the expiration of that time the influenza had disappeared and with it the hemiplegic symptoms, except the ear, which still drooped.

Mastication had become perfect. At the expiration of six weeks, the animal had gained considerably in flesh and was sent to Boston to be sold, contrary to my advice; for whilst being shipped, amidst the noise and bustle, I noticed cerebral disturbance. As I said before, the ear was slightly drooped, and I was not altogether satisfied that everything was right. However, after being there two days, whilst on the track, he dropped dead. So I was told by the seller. Some one in Boston may have further particulars.

JAMES H. TRINK, V.S.

St. John's, New Brunswick, Feb 16th, 1881.

VI.—HOG CHOLERA ON LONG ISLAND.—TREATMENT BY CHLORATE OF POTASH.

J. Lindsay, D.V.S., of Huntingdon, L. I., has sent to the JOURNAL some interesting notes which are of special importance with reference to the question of contagious diseases among hogs in this country. Dr. Lindsay writes us, that on December 17th last he was called to the stock farm of Messers. Stehlin & Co., at Lloyd's Neck, Long Island, and asked to examine a herd ot one hundred and twenty-seven hogs, suffering, as Mr. Stehlin said, from an unknown disease, which he supposed was pneumonia. The following symptoms were gathered at the time: diminished appetite, drooping head and listless appearance, staring coat, and arched back. The eyes and nose discharged at first a watery fluid that subsequently became thick, purulent and sticky. This discharge accumulated around the eye-lids and nostrils. Sometimes the discharge was streaked with blood. Their bodies were covered either with red or purple spots, and backs of ears were very red. There was also a dry, hacking cough. Constipation was followed by diarrhœa, and the discharges were very offensive. The animals withdrew from their companions, and becoming emaciated and weakened, died in pain, in from four to twenty hours. Some few lived for two or three days. At the post-mortem examination of one that had died twelve hours previously, the blood was found fluid and of a dark coffee-color, coagulating very slowly after exposure to the air. The lungs were infiltrated with dark material thought to be blood, and looking like pulmonary apoplexies.

The right lung showed this condition most markedly. The trachea contained bloody froth, and the pleuræ exhibited patches of ecchymosis about the size of five-cent pieces. The heart was soft, flabby, and contained a small amount of blackish blood in the right ventricle, its internal structure being normal. The diaphragm, liver, and spleen and kidneys were normal. The mucous coat of the stomach was covered with large patches of ecchymosis; the large and small intestines also showed ecchymotic spots on their internal surfaces and in their muscular substance. The fœces had a dry, offensive odor. The anus was prolapsed. Blood had flowed from the mouth and nose after death.

Some light is thrown upon the cause of the disease by the following facts: During the summer Mr. Stehlin had been keeping a choice lot of Red Jerseys, Chester, Whites, and Blooded Yorkshires, eighty-seven in number. These animals, which were kept in a large yard with connecting pens, were fed upon diet a of milk and corn meal. Their condition had been excellent all the season. On December 13th he bought at Bull's Head in New York City a lot of forty picked black Berkshire sows. They appeared to be in fine condition, and there was no suspicion that they were in any way tainted, until, on Dec. 25th, four were found dead. Subsequently he remembered that a few had had a dry cough, but at the time it was thought to be merely from an ordinary cold, for which sulphur was given. On the morning of the 27th he found eleven dead, and becoming alarmed, he sent for a veterinarian. The black pigs came from the West by car, and presumably brought the disease, while they themselves were passing through the incubatory stage.

The treatment seems to have been measurably successful, and therefore deserves notice. First the whole herd was divided up into sections of ten each. The diet was changed from boiled turnips, potatoes and beets, to mashed potatoes and linseed meal. This allowance was given them twice daily, and each pig received at the same time potassium chlorate gr. xxx., with brandy, two ounces. Other forms of treatment had been tried by a veterinary surgeon from New York, who was disposed to regard the disease as a simple pneumonia from a cold. He had ordered vinegar and opium, magnesia sulphate, and tannic acid, regulating the medicine so as to control the constipation or diarrhœa. The mortality, however, was four to eight per day. Under the potassium chlorate treatment, it dropped to two to four per day, and in six weeks ceased altogether. Dr. L. states that though he would not like to call his drug a specific, it is fair to assume that it is a valuable remedy.

CORRESPONDENCE.

FOOT-AND-MOUTH DISEASE IN THE UNIEED STATES.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:—

OWING to the apathy of our Government, and the criminal neglect of our legislators, this country has no record of the various contagious diseases which afflict our domestic animals.

The Commissioner of Agriculture at Washington has attempted to investigate the origin and spread of contagious diseases for several years past, but his efforts in this direction have been limited, owing to the non-appreciation of his actions by those who have authority to make suitable appropriations to carry such a work out successfully. Hence, we have only partial reports; but those reports show an alarming state of affairs in our country—hog cholera, contagious pleuro-pneumonia, and foot-and-mouth disease are prevalent, and no effort is made to remedy the evil. Last year, by this report, over ten millions of dollars worth of swine were lost by the plague. No estimate is made of losses by pleuro-pneumonia, and no mention is made of foot-and-mouth disease.

England, by her system of inspection of American imports of live animals, has demonstrated the fact of many contagious diseases existing among American herds.

The mortality among cattle *en route* to foreign ports is readily explained by a glance at the English reports of the condition of these animals on arrival.

Still, our country, in the face of all this accumulated evidence of the existence of contagious diseases, takes no action to check its spread, or relieve the suffering breeder by sending to his aid competent veterinarians.

I have seen foot-and-mouth disease among steers in the Central Stock Yard, Jersey City, and on the next day know that a steamship was loaded with animals from this infected yard.

Other veterinary surgeons that I have conversed with have seen foot-

and-mouth disease at the Union Stock Yards, and still our merchants go on shipping cattle from these infected yards.

Is it any wonder that the mortality is great on shipboard, and the arrival of hundreds of sick animals are reported from foreign ports?

We have no idea of the extent of country over which foot-and-mouth disease has spread, and will not know until our Government enacts such laws that the movement of sick animals will be observed by experts, and by them traced back to their homes, and the contagion stamped out.

There is no possibility of our Government doing anything this year to stamp out, or even to control, the centre of contagion.

Yours, truly,

JAS. D. HOPKINS, D. V. S.

NEW YORK CITY, March 22, 1881.

PROGRESS OF VETERINARY SCIENCE.

NITRITE OF AMYL has been found to work well as an antidote to carbolic acid poisoning. In the case of a horse accidentally poisoned by carbolic acid, the nitrite was used in 30 to 60 drop doses, and great relief was obtained.

COMPOSITION AND AMOUNT OF URINE OF THE HORSE.—Volume in 24 hours, 6 litres (2 quarts); color, yellow amber; reaction, alkaline; density, 1.023; urea, 38 grams (6.3 per litre); hippuric acid, 132 grams (22 per litre); mineral salts, 35 to 40 grams per litre.

CHLORAL AS A SEDATIVE FOR HORSES.—There is reason to suppose that chloral is sometimes given by coachmen to their horses to render them less spirited and more easy to drive. In a case which recently occurred at Bordeaux, the plan answered its end admirably; for a very fiery horse which formerly could hardly be kept in hand, became, after a few days, quiet and gentle. This practice, which has grown to be a serious abuse in some quarters, should be looked to by veterinary surgeons.

TREATMENT FOR PILES IN HORSES.—Drench the animal with one ounce of spirits of turpentine in one pint of castor oil and one of warm water, hot enough to keep the oil thin, twice weekly. Apply the following to the piles with a small glass syringe, or, if not too deep in, with the finger. Tannin, four grains; sulphate of zinc, sugar of lead, chloride of zinc, of each four grains; laudanum, two ounces; olive oil, two ounces. Apply daily once or twice.—*Indiana Farmer.*

HOW TO EXAMINE THE HORSE'S EYE.—Examine the eye first, when the horse stands with his head to the manger. Look carefully at the pupil of the eye in the horse; it is of an oblong form; carry the size of the pupil in your mind, then turn the horse about, bring him to the bright light, and if the pupil of the eye contracts and appears much smaller than it was in the darker light, then you may be sure the horse has a strong, good eye; but if the pupil remains nearly the same size as it appeared in the darker light, the horse has a weak eye, therefore have nothing to do with him.—*National Live Stock Journal.*

Treatment of "Moon Blindness."—In connection with Prof. Moore's article on Moon Blindness, in another part of the Journal, we give the following mode of treatment recommended by Dr. Paaren in the *Live Stock Journal:* The horse should be placed in a darkened stall, and after a meal or two of bran mash, given a physic, composed of five drachms of aloes, and one drachm of podophyllin, two drachms of nitre, and one drachm of capsicum. Bathe the eye thrice daily with warm water, by means of a soft sponge, and apply between the lids, with the aid of a small camel's-hair pencil, a portion of a mixture of half an ounce of Goulard's extract, one ounce of fluid extract of belladonna, and twenty-four ounces of distilled water. Externally, apply to the hollow space over the orbit of the eyes, once daily, a small portion of weak mercurial ointment. Give loosening food in small quantities. This disease is not permanently curable; it is apt to return again and again, and finally end in cataract, or a complication of pathological changes of a permanent nature. Each attack leaves the eye weaker, and partial or total blindness results sooner or later.

A New Poison in Pork has been recently announced in England. It is thought to be produced by the presence of certain rod-shaped bacteria. The symptoms are severe diarrhœa and prostration.

Treatment of Trichinosis by Glycerine.—Several cases of trichinosis have been reported in which recovery took place under the use of large doses of glycerine. The treatment of trichinosis by glycerine is based on the fact that glycerine, when applied to the living parasites, shrivels them up and kills them. The treatment has been employed largely in Germany with varying success. It is hardly probable that glycerine can do anything more than kill the trichinæ that are in the alimentary canal, and we doubt if it even does this.

Treatment of Hog Cholera.—Hog cholera is said to be prevented in France by disinfecting the piggeries, and by giving in each full-grown pig's food a teaspoonful of *levenaijre phenique*, which is made of 2½ ounces of pure carbolic acid, and one gallon of common vinegar; and also by occasionally giving the pigs a dose of nitre or sulphate of soda.

A writer in the *Live Stock Journal* sends the following: Twelve grains of quinine to each hog weighing 250 pounds, or at the rate of five grains for each 100 pounds will, I think, prevent any hog or pig dying that is well enough to eat.

As will be seen elsewhere, Dr. Lindsay has been successful with chlorate of potash.

A New Disease Developed From Hydrophobic Saliva.—Pasteur, Chamberland, and Roux unite in arriving at the conclusion that a new disease can be developed from the saliva of a victim to hydrophobia. The germ which produces the disease is of the shape of a small rod constricted at the middle and imbedded in mucous matter. Strange to say, although closely resembling the microbe which causes chicken cholera, it has no effect upon fowls. The saliva experimented with was taken from a child that had died of a bite from a mad dog. Rabbits inoculated with a dilute solution of it, after suffering from loss of appetite, paralysis, swellings in the groin and in the axillæ, died within 36 hours, and other rabbits inoculated with the blood of those which had been poisoned with the saliva soon died also. Dogs similarly treated did not live more than two or three days, but they did not manifest any of the symptoms of rabies. Guinea pigs, although so like rabbits, seemed to escape almost all evil consequences. The experimenters are of the opinion that the disease is quite different from hydrophobia; but they have not as yet pushed their researches far enough to be able to say what precise connection exists between the two maladies.

CURE FOR DOG DISTEMPER.—TWO VIEWS.—I see it stated in your valuable paper of January 13th, that there is no cure for dog distemper. In this Dr. Horne is mistaken. The remedy is common salt. Open the dog's mouth and put a lump of salt about the size of a hen's egg on his tongue, then close the dog's jaws together, and hold until the salt is dissolved and swallowed. If this does not give relief in a few hours, repeat the dose until the dog vomits freely.—*Country Gentleman.*

A cure for this is frequently asked for. There is no cure for distemper. Like scarlet fever, measles, small-pox, &c., it must run its course, and any man who assumes to cure any of those diseases (and many others similar) should receive the contempt due to arrogant ignorance. All these diseases are subject to skill and proper medication. All that the most scientific can do is to administer such medicines as will, with proper and judicious nursing, bridge over, so to speak, the crisis, and so bring it to a favorable termination. Nothing more can be done.

We endorse the last view, which is that of Dr. William Horne. Another correspondent gives the following directions for preventing the disease:

Feed puppies on milk and vegetables well cooked and salted; flour and meal (especially oatmeal) made into pudding or bread, till they are about nine months old, and they will rarely be affected with the distemper. Give a bone now and then to gnaw; also to mix soup with the bread, pudding or vegetables, is a good thing. My friends and self have thus raised many puppies for years past, and not a single case of dog distemper.—*Country Gentleman.*

FOOT-ROT is a very troublesome disease to the shepherds in wet or muddy places, or wet pastures. The cause is as follows: Between the hoofs of the sheep a small aperture may be seen, called the biflex canal, whose office it is to secrete an oily fluid for the purpose of lubricating the hide between the hoofs, it being called into action by every step the sheep takes in providing its food. When perpetually wet, or constantly dirty, the parts swell, and this secretion already spoken of is stopped, or retarded; therefore not only is the hide deprived of the oily secretion, but the secretion itself becomes an irritant of the glands which secreted it; hence inflammation is the consequent result; hence foot-rot, which, unless retarded and remedied very soon, destroys not only the hoofs, but the glands, and perhaps the corohary border which secretes the hoofs.—J. N. NAVIN, *Indiana Farmer*.

DYSPEPSIA IN HENS.—Chickens are sometimes troubled with indigestion. The symptoms are dullness and fullness of crop. When in this condition they are said to be "crop-bound." If the contents of the crop seem to be of a liquid nature, pulverized charcoal is an excellent remedy; but if the crop is hard and solid, a surgical operation is the only means of relief, and unless the bird is a very valuable one this will not pay. A constant supply of charcoal and occasional feeds of raw unions will prevent indigestion.—*Indiana Farmer*.

TRANSMISSION OF TUBERCULOSIS.—According to M. Toussaint and M. Larrey, bovine tuberculosis is transmissible in the following ways: 1st, by the ingestion of tuberculous matters; 2d, through the teat of a tuberculous cow; 3d, through the blood by inoculation; and 4th, by simple contact.

According to M. F. Pench (*Comptes Rendus*) it is an undoubted fact that consumption can be transmitted to the human subject by the use of the milk of a cow affected by this disease. While we do not consider the latter point absolutely established, there is enough evidence of its truth to make it extremely important.

DISEASES OF SHEEP.—Some very interesting facts regarding this subject were given by Dr. J. N. Navin, in an address before the Indiana Wool and Drovers' Association, printed in the *Indiana Farmer*, though we are hardly prepared to accept Dr. N.'s statement that malaria has so powerful an influence in causing disease among sheep. The sheep, he says, is naturally the healthiest, though the tenderest of all domestic animals, scarcely ever getting sick except from some great provocation, malarial influence having more to do with it than all other causes combined. In Europe the sheep is subject to about twenty-five diseases, none of which are incident without cause or provocation, except, perhaps, thrush in the mouth, or blain. With these two exceptions, all others are the result of bad treatment, or of malarial influence. Foot disease, the rot, and dropsy are the result of malaria and pasturing upon wet and marshy lands. Diarrhœa and dysentery are the effect of feeding, or of some affection of the liver by malaria. Water on the brain, epilepsy, apoplexy, hydatid on the brain, and lockjaw, have causes the same as in other domestic brutes. Bots in the sinuses of the head are the larvæ of the fly, so-called, but smaller than those which horsemen dread so much. Bronchitis, lung fever, colic and inflammation of the brain are also manufactured diseases, or the effect of treatment, or usage.

IS CHARBON TRANSMITTED BY PLANTS AND THE SOIL?—Dr. Colin has been examining experimentally the claims of Dr. Pasteur that charbon can be transmitted by plants which may be grown in the place where charbonized bodies have been buried. He had taken the opportunity of burying sixty animals, dying from charbon, in the soil at varying depths. The grass and shrubs growing on the soil have been eaten by rabbits without producing charbon. The earth taken from immediate contact with the carbonized body has been mixed with forage and used as food for animals, without any result, and the water in which this earth has been dissolved has been mixed with food and given to animals. It has also been inoculated, but in not a single case did charbon result, whence he concludes charbon is not transmissible by plants or the soil.—*Chicago Medical Review.*

ROUP IN FOWLS.—A correspondent of the *Indiana Farmer* writes: "Our chickens are affected with a disease unlike anything I have ever seen or heard of before. It affects their eyes, feet and mouth. In some of the fowls it makes its appearance first in their eyes, in others it will appear first in their mouths. Their eyes will become closed, the lids stick together. On opening them we find a milky matter, also pieces of thick clotty matter will adhere to the ball and lids, which may be scraped off, and leaves the places raw and bloody. The roof of the mouth, the tongue, and the mouth of the windpipe have this same kind of thick matter on them. They seem to be eating sores. Their windpipe sometimes will become so swollen as to make it almost impossible for them to breathe. It is a lingering disease; sometimes they live for two or three weeks. Occasionally one will get over it."

In answer to this, the Editor says: The disease is no doubt an aggravated form of roup. Separate the diseased fowls from the well, putting them in a dry, warm place, and give a dose of castor-oil every morning for a week. Mix pepper with their feed, which should be soft and warm. Wash head and eyes and inside of mouth and nostrils with vinegar in water. It is cleansing and healthy.

BLACK-LEG (EXTERNAL CHARBON), NOT ANTHRAX.—ANOTHER PROTECTIVE VIRUS.—Dr. D. E. Salmon (*Cultivator and Country Gentleman*), reviewing the history of the above two diseases, is of opinion that they have been proved distinct affections.

The disease known as black-leg is generally fatal. It makes its appearance suddenly, with dullness, loss of appetite, and the formation of an irregular swelling, not plainly circumscribed, and appearing on the trunk, neck, under the jaw, or on one of the legs. This swelling increases with astonishing rapidity, invading the muscles and the inter-muscular interstices. At first it is homogeneous and very painful, but becomes by degrees insensible, crepitating and resonant in its centre; the tissues forming it are black and friable, and on incision, there escapes blood, which is at first red, then black, and finally the escaping liquid is a frothy serum, with a large quantity of gas. While the local symptoms are developing, the general condition is aggravated, the temperature rises at first, then falls, and the animal dies in thirty-six to forty-eight hours.

In the areola tissue and serum of the tumor, and, at times, in the lymphatic glands, kidneys, lungs, and even blood, are found bacteria, existing as bright oval corpuscles, single or united end to end, to the number of two or three, and also short rods moving in all directions. These rods are shorter and broader than those seen in anthrax; they are very motile, rounded at their two extremities, and are nearly always provided near one of these, never in the middle, with, a clear nucleus. These bacteria are different from those of anthrax.

Further, by properly preparing the virus of the disease, and injecting it into the veins, there results simply dullness, loss of appetite and fever, the temperature not rising more than 1.9° C. (3.4° F.) in extreme cases; and these symptoms remain but one, two, or three days, disappearing generally more rapidly with the calf and goat than with the sheep. Such inoculation does not produce local swellings when proper precautions are taken to prevent the virus touching the areolar tissue at the point of inoculation.

Finally, such intra-vascular inoculation enable the subjects to resist subsequent injections of virus into the areola tissue or muscles; instead of the inflammatory tumor ending in death, which follows such inoculation in susceptible animals, there is only an abscess, in which, however, the bacterium preserves its activity.

Thus we have another method of preventive inoculation. Within the last year such methods have been discovered for three distinct contagious diseases, viz., anthrax fever, symptomatic charbon, and chicken cholera.

It should be remembered, in connection with these experiments and alleged discoveries of the French investigators, that they still lack corroboration, and the role of the bacteria in the different diseases is by no means demonstrated to be a fundamental and essential one.

NEWS AND MISCELLANY.

Mustang Liniment is composed of oleic acid, aqua ammonia, petroleum, and naphtha.

Bi-Carbonate of Potassium in Rheumatism in cattle and dogs is recommended as preferable to salicylic acid by Prof. Robertson, of Edinburgh.

A British Congress of Veterinary Surgeons.—It is proposed to hold a congress of veterinary surgeons in London this year, to discuss matters of interest to the veterinary profession.

Social Recognition of Veterinary Surgeons.—English veterinarians are elated because the Prince of Wales has invited one of their number to dinner, and has thus given social recognition to the profession.

A Veterinary College for Ireland.—A petition has been forwarded to the Lord-Lieutenant asking for a subsidy of $50,000, with which to establish a veterinary college in Ireland.

The New York Aquarium.—We regret to announce that the New York Aquarium has been closed on account of lack of support. The last of the chimpanzees at the institution died there on February 12th, of a throat affection.

A New Zoological Garden in New York City.—A company has been organized in this city with the object of constructing a Zoological Garden here that will eclipse anything in the world.

Prize for an Essay on Paraplegia in the Horse.—A prize of 200 rupees has been offered by the Governor-General of India for the best essay on paraplegia in the horse. The prize is open to general competition. All essays must be handed in by October 1st, 1881.

Veterinary Medicine in England.—A bill to regulate the practice of veterinary medicine in England has been drafted and presented to Parliament. It forbids any one to use the title of veterinary surgeon unless he has received a diploma or license from the proper regulating body.

Salicylic Acid in Foot-and Mouth Disease.—The Duke of Brunswick has successfully treated cases of foot-and-mouth disease among his herd of cattle in Prussian Silesia by salicylic acid. A solution of the acid in hot water is applied externally to the mouth and hoofs, and the drug is given internally in doses of one to two drachms six times a day.

Death of a Veterinary Surgeon from Strychnine.—Ernest Traver, of Rhinebeck, N. Y., in the employ of Mr. Lorillard as a veterinary surgeon, died on March 22, from the effects of an overdose of strychnine, which he had taken for a bad cold an hour previous. He was suffering from nervous prostration at the time, and, it is believed, took more of the fatal drug than he designed.

Foot-and-Mouth Disease in New York City.—The steamship France, of the National Line, brought to this city in January last, besides a number of dogs and horses, two bulls and eight Alderney heifers. Mr. James D. Hopkins, who was detailed by Gen. Patrick to inspect the cattle, found that they were affected with epizootic aptha, or "the foot-and-mouth disease." The animals were promptly quarantined, and no harm has resulted. They subsequently recovered from the disease.

An Analysis of the Haas Hog Cholera Remedy, made by the Agricultural Department, gives the following result:

Powdered soap	10 per cent.
Potassium carbonate . . .	5 "
Red ochre	12 "
Precipitated chalk . . .	50 "
Quicklime	10 "
Calcined magnesia . . .	13 "
	100

This shows it to be very much like a humbug.

Strange Cattle Disease.—A disease unknown or undiagnosticated has broken out among the cattle at East Watertown. The stock attacked are blooded animals, and were in the very best condition. Several of them have died. They are taken first by an intense coughing, which is followed by a loss of appetite and a shrinkage of milk. When let out where they can have perfect freedom they appear almost crazy, and will bite themselves, tearing out pieces of flesh, and appear to be in the greatest agony. The attention of the State authorities has been called to the matter.

An Epidemic of Spinal Meningitis Among Horses.—There were said to be, a short time ago, thirty dead horses lying on the bank of the Connecticut river, a mile or two below Hartford, Connecticut. They were victims of spinal meningitis. At Wooley's stables, Main street, Hartford, several cases have occurred, and some are now under treatment; so of some other stables thereabout. Only a few stables, as yet, appear to have it. The disease attacks the horses of private owners as well as those of the livery stables. The main treatment seems to be to give physic balls and a mustard plaster, and blanket the horse. Comparatively few die.

SELLING DISEASED MEAT.—A butcher living on West Thirty-Eighth street was recently convicted of selling diseased meat, and sentenced to three months in the Penitentiary, with a fine of $250. There were found in his establishment 220 heads of diseased meat, 7 baskets of putrid meat, and 81 quarters. The meat sold for five cents a pound, and was used in making sausages. Diseased meat is said to be preferred for New York bologna sausage.

CONNECTICUT VETERINARY LAW.—There is in Connecticut a law which authorizes a board of commissioners to take possession of any domestic animal which is supposed to be sick with a contagious disease, and dispose of it as they may judge best, keeping it, or compelling the owner to keep it, in quarantine until the disease has been sufficiently developed to allow its character to be determined, or making it the subject of veterinary investigation, or killing it.

THE HOG CHOLERA AND TRICHINOSIS SCARE.—The British Consul at Philadelphia, several weeks ago, wrote home that hog cholera was very prevalent in this country. This report caused great alarm and agitation among American pork dealers. Investigation has apparently shown that the disease is somewhat less prevalent this year than usual. The canard, however, brought out the fact that an enormous number of hogs die from this disease every year, the number in Illinois alone in 1879 being about 300,000.

RURAL PHYSIOLOGY—The editors of the *Country Gentleman* received and published the following: "For two weeks there has been an animated discussion in this village as to whether cattle raise their food (hay, straw, &c.) after swallowing it once, and go through the process of mastication. Has a cow or ox the power to raise a cud from the stomach at will? Please give authority on the above subject.—BOVINE, *Jefferson, N. Y.*"

Where is this place in which no one knew certainly whether or not cows ruminated? We suggest for the next "animated discussion" the question: Is the prevailing color of the grass in Jefferson, N. Y., a green; and why?

EXTENT OF PLEURO-PNEUMONIA IN THE UNITED STATES.—It has never extended over any considerable area, the eastern parts of Maryland and Pennsylvania being the extreme western, and northern Virginia the extreme southern limit, while no case has ever been reported in any locality in the State of New York farther north than the county of Putnam—about fifty miles from New York city. The efforts made by the State authorities within two years past for the suppression of the disease have been so far successful that all the State of New York is cleared, excepting Kings and Queens counties (on Long Island). Pennsylvania is reported entirely free from it, and the measures adopted in New Jersey and Maryland have prevented its extending beyond the three or four counties in which it has occurred. Still foci of the disease exist, and it may be carried west at any time.

FOOT-AND-MOUTH DISEASE IN ENGLAND.—Foot and-mouth disease has spread with great rapidity throughout England, and all fairs and markets have been stopped for a time by Order of Council; probably the order will be renewed at its expiration. Ireland is free from the disease, no cases having been reported since the autumn of 1879; and the Irish Veterinary Department has very properly issued an order prohibiting the importation of cattle, sheep, and swine into Ireland from England. Scotland is also free from the disease, and it is probable that English cattle, sheep, and swine will be prohibited from crossing the border, the necessary powers, both with regard to Ireland and to Scotland, having been conferred by recent legislation.

DOES FOOT-AND-MOUTH DISEASE EXIST IN THIS COUNTRY?—This question has been agitated extensively in the columns of the *Live Stock Journal*. It is asserted by certain English veterinarians that we have the disease, because large numbers of cattle have arrived in England from the United States affected with it. According to Dr. Lyman (*Report on Contagious Diseases*) three cases were landed in Liverpool from Boston last July. Mr. Turner, of Tunbridge, England, states that 380 head of cattle with the disease have been brought from the United States to England. But he does not state the time. On the other hand, it is asserted by the *Live Stock Journal* that there are no known cases of the disease in the country now, or at least in the West; and it is very unlikely that so contagious an affection would exist there without its making some stir. Our correspondent, Dr. Hopkins, is, as will be seen by his letter, decidedly of the opinion that foot-and-mouth disease does prevail in the United States. And the evidence in favor of this view is very strong.

THE BROWN INSTITUTION.—The "Brown" Institution is at Lambeth, Eng., and is practically a hospital for dogs, horses, cattle, and other animals. It is a large establishment, and between two and three thousand "patients" come under treatment every year. Of the 2,465 animals treated there last year, 1,637 were horses, 60 donkeys, 527 dogs, 100 cats, 10 goats, 2 pigs, and 129 smaller animals. Of these, 76 were admitted as in-patients, while the rest were treated entirely as out-patients. A course of five lectures is delivered annually, usually before Christmas. Last year Dr. Greenfield, the professor superintendent, chose for his subject the pathology of pyæmia, septicæmia and anthracoid diseases. This year he gives the results of his further investigations into anthrax and allied diseases in man and the lower animals. His description of woolsorter's disease was most interesting, and is likely to attract considerable attention. The course is illustrated by microscopical demonstrations, photographs, pathological specimens thrown on the screen with the lime light, and so on.—*Therapeutic Gazette.*

CLARKE ON THE USES OF THE CANINE TEETH.—Mr. W. H. Clarke, in his interesting work on "Horses' Teeth," noticed in our previous issue, shows not only a great deal of painstaking research, but occasionally some touches of humor. We quote his remarks upon the uses of the canine teeth or tushes:—"The Canine Teeth (*laniarii dentes*), comparatively speaking, are of little practical use; at least they are of little use to the modern horse. They have been much reduced in size during the evolution of the horse, and, if Darwin's theory is correct, are probably 'in the course of ultimate extinction.' They distinguish the sex, it is true, but their loss would not be felt on that account. The horse sometimes uses them in tearing bark from trees, for he is by instinct his own (botanical) doctor, and the bark is his medicine. The sharp points of the tushes penetrate the bark more readily than the incisors, and apparently the horse wishes to save his incisors, thus showing his horse-sense. Their nature is different from that of the other teeth, for the incisors and grinders grow till old age. This is not the case with the tushes, and, further, they are never in apposition (superposed), and consequently do not wear one another."

CONGRESS AND VETERINARY MEDICINE.—An effort was made at the last session of Congress to create a National Commission for investigating the contagious diseases of animals. The Agricultural Department had one scheme, which, of course, placed the whole matter in its charge. The Western men, on the other hand, wished to have the matter under the charge of a separate commission. It is the opinion of our Western stock breeders, as evidenced by the statements of the *National Live Stock Journal*, that the Commissioner of Agriculture does not know how to investigate contagious diseases among animals. His veterinary assistants, we infer from the same authority, are sunk in professional ignorance, and are chiefly desirous of proving that contagious pleuro-pneumonia exists, or has existed, in Western cattle; also, that foot-and-mouth disease does prevail in the United States. The *National Live Stock Journal* is very much set in the conviction that there are not any, and shall not be any, contagious diseases among Western cattle. Towards this view of the matter, which the journal referred to has so far sustained with great ability and success, the Commissioner of Agriculture and his agents do not feel so kindly. We do not express any opinion here on the merits of the controversy. It is enough to know that it contributed to the unfortunate result of killing the bill before Congress for further investigations of contagious disease. The sole act of Congress favoring veterinary medicine was the printing 50,000 copies of the Commissioner's special report on contagious diseases. It forms a beautiful comment on the intelligence in this direction of our national legislators.

TRICHINOSIS AND AMERICAN PORK.—The discovery of trichinae in American pork imported into France, has so alarmed that government that they have prohibited its importation. This cuts off the exportation of 76,000,000 pounds of pork per year from America. Italy, Spain, Portugal, Germany, Russia, and Greece, have made the same restrictions.

The Swiss government has become alarmed also, and it recently undertook an investigation of the matter. As a result of this, it was concluded that the danger of trichinosis from the source in question was very slight. No authentic instance of trichinosis from American pork imported into Europe is recorded. Switzerland, Belgium, and England, have all refused to follow the example of France.

These countries have, undoubtedly, shown the most judgment and good sense in thus refraining from yielding to a senseless panic.

Nevertheless, American pork dealers should remember that their trade is still on a precarious footing. It has been proved that trichinae do exist in American swine, and that to a large amount. Should trichinosis be actually induced by these in any European country, the injury caused by the action of France would be repeated, and, perhaps, on a more extensive and permanent scale.

Let the pork dealers look to the source of the evil, therefore. Let them find some way to keep trichinae out of pork, or to keep the trichinous pork out of the market.

COLUMBIA VETERINARY COLLEGE—FOURTH ANNUAL COMMENCEMENT.—The Fourth Annual Commencement of the Columbia Veterinary College was held at Chickering Hall, April 7th, 1881. A large audience was present, and showed evidence of much interest in the exercises. The stage was decorated with flowers, and the music was excellent. Professor Louis H. Laudy presided. The Introductory Address was delivered by Dr. T. E. Satterthwaite, and was a very interesting and carefully prepared effort. Prof. E. S. Bates, Dean of the College, conferred the degrees, and the award of prizes was made by Prof. A. S. Heath.

The Valedictory Address, which was exceptionally good, was pronounced by M. L. Frey, D.V.S.

Prizes were awarded as follows:

Anatomical Prize to E. J. Peck, D.V.S.; Pathological Prize to George H. Parkinson, D.V.S.; Silver Medal to E. A. MacLellan; Gold Medal to George H. Parkinson, D.V.S.

The exercises were closed by addresses given by S. D. Sewards, Esq., and Rev. J. H. Rylance.

The following is the list of graduates:

J. H. Dancer, D.V.S., Newark, N. J.; Charles Dunne, D.V.S., New York; Mark L. Frey, D.V.S., New York; George H. Parkinson, D.V.S., Middletown, Conn.; E. Judson Peck, D.V.S., New York; Emile M. C. Savale, D.V.S., Orange, N. J.; Theo. Simons, D.V.S., New York; H. S. Vanderhoff, M.D., D.V.S., Williamsburg, N. Y.; John Campbell Wallace D.V.S., New York.

The following students received the Junior Certificate:

E. S. Breeder, G. F. Bowers, E. F. Dowd, E. W. Douglass, E. M. Fitzgerald, D. Johnston, E. A. MacLellan, P. Newman, W. Soula, F. J. Smith, H. W. Tolles.

The session just closed is said to have been the most satisfactory and successful one since the organization of the College. Already there is felt the need of enlarged accommodations. The interest in Comparative Medicine constantly deepens, and the more intelligent and discerning young men see both honor and pecuniary reward in the practice.

COLUMBIA VETERINARY COLLEGE,

AND

School of Comparative Medicine,

217 EAST 34th STREET, N. Y.

FIFTH SESSION—1881.

FACULTY OF MEDICINE.

Erskine S. Bates, M.D., D.V.S., Dean of the College,	Professor of Materia Medica and Therapeutics.
Louis H. Laudy, Ph.D., D.V.S.,	Professor of Chemistry.
Charles L. Dana, A.M., M.D.,	Professor of Comparative Physiology.
Edmund C. Wendt, M.D.,	Professor of General Comparative Anatomy.
Wm. H. Porter, M.D., V.S.,	Professor of Surgery.
Thos. E. Satterthwaite, M.D.,	Lecturer on Histology and Pathology.
Allen S. Heath, M.D.,	Professor of Cattle, Sheep, and Swine Practice.
W. O. Moore, M.D., D.V.S.,	Professor of Ophthalmic Diseases.
B. E. Hays, M.D., Ph.G.,	Professor of Pharmacy and Obstetrics.
George H. Berns, D.V.S.,	Professor of Equine Practice.
F. J. Wilson, D.V.S.,	Lecturer on Clinical Surgery.
F. Walton, D.V.S.,	Lecturer on Equine Anatomy.
W. H. Neuschafer,	Lecturer on Veterinary Jurisprudence.
N. F. Thompson, D.V.S.,	Demonstrator of Anatomy.
Edward A. MacLellan,	Lecturer on Shoeing.

HOSPITAL ADVANTAGES.

The Infirmary connected with the college is open for clinical instruction during the session, Medical and Surgical clinics being held daily. In addition, the Berns, Cuff, Wilson, and other infirmaries afford weekly clinical facilities. Over 1000 animals were seen and prescribed for by the professors and teachers during the last session. The large stock yards in the immediate vicinity of the college enables the professor of cattle practice to freely illustrate his lectures, and the Central Park Menagerie affords the best of opportunities for the study of disease in wild animals under confinement. The facilities thus afforded enable the professors to teach thoroughly their subjects, both theoretically and practically.

THE REGULAR SESSION will commence the first Wednesday in October, and continue six months. There will be seven lectures daily in the various departments of veterinary medicine and surgery.

Fees for the Regular Session.

Matriculation Fee, payable each term,	$ 5 00
Fees for the Single Course of Lectures,	115 00
Perpetual Ticket, in Advance—*i. e.*, good for two or more terms,	150 00
Graduation Fee,	25 00

Material for dissection furnished free of cost. All tickets and fees to be paid for in advance at the beginning of the term. Graduates of the school are admitted without fee. Graduates of other schools are admitted on a general ticket by paying the matriculation fee. Good board can be obtained from $4 and upwards.

For further particulars and circular apply to the Dean of the College,

Professor E. S. BATES, M.D., D.V.S.

Written Examination of Graduating Class of Columbia Veterinary College, 1881.

QUESTIONS.

GENERAL COMPARATIVE ANATOMY.

1. Give the meaning of cell, tissue, organ, histology, biology, taxonomy, embryology, protoplasm.
2. What are the characteristics of living matter?
3. Point out the principal differences between the alimentary canal of carnivorous and herbivorous animals.
4. Mention all the openings of the pharynx of the horse.
5. Describe in general terms the heart of mammals.
6. Define fauna, flora, districts of distribution, species, genus, order, class.
7. State the most striking peculiarities of the stomach of the cow.
8. Enumerate the principal folds of peritoneum in the horse.
9. Mention the general characteristics of birds.
10. Which type of animals embraces the lowest, and which the highest forms of life?
11. Give the classes of the artificial system of Linnæus, also Cuvier's types.
12. Mention the openings of the cloaca of birds.
13. Describe the structure of the ovary of mammals.
14. Give the dental formula of the horse, pig, human being.
15. Mention varieties of ganglion cells, nerve-fibres, blood-vessels.
16. Describe the coverings of the spinal cord of the horse.
17. What different kind of glands are found in vertebrates?
18. Describe the stomach of the horse.
19. Give the structure of the small intestine of the sheep.
20. State what you know about the respiratory apparatus of the swan.

EQUINE ANATOMY.

1. Give the classification of bones and peculiarities of each.
2. Describe the scapula, humerus and femur.
3. Describe a dorsal and cervical vertebra.
4. Describe the os pedis.
5. Give ligaments of the humero-radial and carpal, and the first phalangeal articulation.
6. Name ligaments of coxo-femoral, femoro-tibial and tarsal articulations.
7. Describe the ligamentum nuchae.
8. Give the origin and insertion of the muscles having an attachment on the scapula.

9. Give the origin and insertion of the extensors and flexor of the antebrachial region.
10. Name the muscles that have an attachment on the femur.
11. Name the muscles having an origin on the tibia.
12. Give the collateral and terminal branches of the common aorta.
13. Give the collateral and terminal branches of the posterior aorta and where distributed.
14. Give the anatomy of the alimentary canal.
15. What are the layers of the peritoneum and the folds of the same?
16. Give the circulation of kidney.
17. Give the circulation of liver.
18. Give the divisions of the brain and the tunics of the brain and spinal cord.
19. What do the cranial nerves supply and their functions?
20. Describe the cartilages of the larynx.

PHYSIOLOGY.

1. Name the most important proximate principles of the body, and assign them to their classes.
2. What is the blood composed of, and what are its uses?
3. Describe the course of the blood through the circulatory system, and give the causes of its flow.
4. What is the effect upon the heart of cutting the pneumo-gastric nerve?
5. What is the vaso-motor system of nerves?
6. What changes take place in the air in respiration?
7. Name the different digestive fluids which the food meets in passing through the alimentary canal.
8. Give the special function of each of these digestive juices.
9. What are the functions of the liver?
10. Name the secretions that are found in the body.
11. What is the difference between a secretion and an excretion?
12. What are the chief organs of excretion?
13. Give the principal ingredients of the urine.
14. How does the food that has been digested in the stomach and intestines, get into the blood?
15. What substances make up the different kinds of food?
16. What is the nutritive ratio?
17. What is the proper diet for a work horse?
18. What is the nutritive ratio in that diet?
19. What are the functions of the spinal cord?
20. What is a motor, and what a sensory nerve?

CHEMISTRY.

1. What is oxygen? Where does it occur and what are its functions in nature?
2. How is hydrogen prepared? And what are its properties? Mention important compound with oxygen?

3. Give the composition of water by weight and volume.
4. Name the common impurities found in drinking waters, and give their origin and influence on the health of animals using it.
5. Mention different kinds of waters found in nature.
6. What is a mineral water?
7. What is a saline?
8. What waters are most liable to contamination?
9. How may water be purified?
10. What renders water unfit for washing?
11. What is nitrogen? Where found, and what are its properties?
12. Tell difference between a mixture and chemical compound.
13. What is the composition of the atmosphere in full?
14. Explain effect of moisture on health.
15. Mention important compounds of nitrogen with hydrogen.
16. What is CO_2? How does it occur, and what important part does it play in nature?
17. Name the important mineral acids and their properties.
18. How can you prepare chlorine, and what are its properties?
19. Give formula for *laughing gas*, and how prepared.
20. Write formula for following compounds: *Nitric acid*, *sulphuric acid*, *hydrochloric acid*, *carbonic acid*, *ammonia*, *salt*, *lime*.

PHARMACY.

1. Give the number of grains in an officinal ounce.
2. Give the number of grains in the commercial ounce.
3. How many fluid drachms in the fluid ounce?
4. How many fluid ounces in the pint?
5. Write gr. i., gr. xv., ʒ i., ℥ ss, ℥ i., in the metrical system.
6. What is the boiling point of water, centigrade thermometer, Fahrenheit?
7. Convert 120° centigrade, to the corresponding degrees, Fahrenheit scale.
8. Name the principal parts of a prescription.
9. Give the strength of the following preparations of opium: Tinct. opii, vini, opii, pulvis doveri, solut. morphiæ, (officinal,) solut. morphiæ Magendi.
10. Copy the following prescription, and write it in the metrical system:

℞

Pulvis Aloes, . . .	ʒ i.
Hydrarg. Chlor. Mite	ʒ iss.
Pulvis Zingiber . .	ʒ ss.
Mel	ʒ ss.

Mise fiat *bolus*.

SHOEING.

1. Give a description of the different parts of which a horse's foot is composed.
2. What are the primary causes in producing the different forms of hoofs?
3. What relation does the form of the hoof bear to the diseases to which the foot is subject?
4. Is contraction of the hoof a cause or a result of disease?
5. Name some of the frequent causes of contraction.
6. How should the horse's feet be tested for soundness?
7. What do we include under the term shoeing?
8. What relation does good shoeing bear to the health of the horse?
9. What relation does shoeing bear to diseases of bones, joints, ligaments, tendons, and muscles?
10. How may shoeing be an exciting cause of ringbone, spavin, laminitis, corns, quarter-cracks, quittors, etc.?
11. What relation does shoeing bear to the gait and speed of the horse?
12. How can shoes be applied to prevent structural changes from laminitis?
13. How shall the horse's feet be treated during sickness or idleness?
14. What popular methods are to be condemned in prevention of interfering and overreaching?
15. How may contraction of the hoof be prevented and cured?
16. How should the spavined horse be shod?
17. How should the wide, flat foot be shod?
18. How should the foot with navicular disease be shod?
19. How should the foot afflicted with corns be shod?
20. What constitutes good shoeing?

OBSTETRICS.

1. Name the bones of the pelvis.
2. What bones form the symphisis pubis?
3. What ligament transforms the pelvic cavity into a complete canal?
4. What pathological change results from compression of the gravid uterus on this ligament?
5. What are the diameters of the inlet of the pelvis of a horse?
6. In what respect does the mucous membrane of the uterus differ from ordinary mucous membrane?
7. What is the canal of Gärtner, and in what animals are they found?
8. Give the signs of pregnancy.
9. Give the duration of pregnancy in the mare, cow, sheep, and goat, pig, bitch, and cat.
10. What is a free-martin?

MATERIA MEDICA AND THERAPEUTICS.

1. Define and illustrate general remedies and local remedies.
2. What is the best purgative for a horse, for a cow, for a sheep, for a dog? Which the best form for the exhibition and dose of each?
3. Mention names of four cardiac sedatives. Give the officinal preparations of each, and the dose of each for a horse.
4. Write names of four cardiac stimulants. Give the officinal preparations of each, and dose.
5. What are the therapeutic properties of belladonna and the preparations?
6. What are the peculiar properties of digitalis?
7. Which are the acid tonics, and what is the most marked therapeutical action of each?
8. Which of the iron tonics has least astringency?
9. What are the substances which enter into the composition of tincture of iron?
10. What is meant by the term "active principle" as applied to drugs?
11. What are the active principles of opium?
12 In how many ways can medicine be exhibited or administered?
13. Write the names of three hydrogogue cathartics and three hydrogogue diuretics.
14. What are the officinal preparations, doses, and therapeutical properties of antimony?
15. What remedies are indicated for the cure of tetanus?
16. What effect has combination on drastic cathartics?
17. What are the officinal preparations of ammonia, and how should they be exhibited?
18. What is an alterative medicine?
19. What are the therapeutic properties of nitrate of potash?
20. What is the composition of the compound spirits of ether?

COMPARATIVE PATHOLOGY.

1. Mention the morbid appearances that are most noteworthy in nasal glanders.
2. What organs are chiefly involved in hog cholera (swine plague); describe the nature of the changes.
3. Give the cause of the "rot" in sheep, and explain how the symptoms are produced.
4. The *trichina spiralis*; which of the lower animals does it infest?
5. How can trichinosis be diagnosticated in the human subject?
6. How may the presence of albumen in the urine be determined?
7. Describe the excretory apparatus in a horse's kidney.
8. What is the naked eye appearance of the lung in the contagious pleuro-pneumonia of cattle?
9. What is an haversian system?
10. What are the morbid changes in farcy or external glanders?

11. What are the lesions of foot and mouth disease in cattle?
12. Mention the supposed cause of anthrax, and some of the names under which the disease is sometimes known.
13. What is the difference in structure between the striped and the unstriped muscular fibre?
14. What is embolism?
15. What are the characteristic differences between the red and the white corpuscles in mammalian blood?
16. The difference in type between carcinoma and sarcoma.
17. What is fatty degeneration; calcification?
18. Give the minute anatomy of an hepatic lobule or acinus.
19. How are aneurisms produced?
20. Give the structure of a medullated nerve.

SURGERY.

1. Give the difference between anæmia and phethora.
2. When does determination or active congestion play an important part in surgery?
3. Give a complete definition for inflammation, the pathological changes, the modes of termination, the products, symptoms and treatment for the same.
4. How are inflammatory effusions divided, and which are of surgical importance?
5. What is suppuration?
6. What is an abscess, with the symptoms and the treatment of the same?
7. Give a definition for ulceration, and the points to be observed in diagnosticating an ulcer.
8. What is a sinus, with the best methods for treating the same?
9. What is the difference between laudible and ichorous pus?
10. What is a quittor, and how best treated?
11. Give the leading points of difference between a healthy and an indolent ulcer?
12. What is a wound, and the methods by which it is permanently closed?
13. Give the various principles that are to be carried out in treating wounds.
14. How would you tell an arterial from a venous hemorrhage, and under what circumstances might an arterial be taken for a venous?
15. What are the surgical means for closing wounds?
16. What are the various methods for arresting arterial hemorrhage?
17 What bone in the horse is the most frequently dislocated, and how would you treat the case?
18. What is a fracture?
19. What are the signs, symptoms, and best methods for treating fractures?

20. Give the causes, pathology, symptoms, modes of termination, prognosis, and treatment of acute synovitis, and state which joints in the horse are most frequently affected.

EQUINE PRACTICE.

1. Mention seven diseases which may produce a discharge from the nostrils.
2. Number of pulsations and respirations per minute in health—normal temperature of body.
3. Mention six separate and distinct causes of anaemia.
4. Symptoms of febra pyogenica.
5. What are the most frequent complications of febra pyogenica?
6. What are the diagnostic symptoms of the second or exudative stage of pneumonia?
7. What are the diagnostic symptoms of the first stage of pleurisy?
8. Mention four of the most frequent diseases of the digestive organs.
9. Give causes of azoturia.
10. Differential diagnosis between retention of urine and suppression of urine.
11. Mention three diseases of the feet in which the heels are brought to the ground first while in motion.
12. Mention ten diseases of the limbs or feet in which the toe is brought to the ground first while in motion.
13. What is a keratoma?
14. What are the symptoms of rupture of the suspensory ligament.
15. What are symptoms of rupture of the gastrocnemii muscles?
16. Mention five curable simple fractures.
17. What is a spavin?
18. Why does spavin lameness generally precede the development of the bony deposit?
19. Give symptoms of tetanus.
20. What are the causes of retention of urine?

CATTLE AND SHEEP PRACTICE.

1. Define the terms disease and health.
2. Explain term contagious disease, and write names of four contagious diseases.
3. What is the domain of veterinary sanitary science?
4. Define sporadic, enzootic and epizootic diseases, and give an illustration of each.
5. What is meant by the period of incubation in diseases?
6. Define rumenotomy, and describe the operation for it.
7. Give the differentiation of sporadic pleuro-pneumonia and pleuro-pneumonia contagiosa.
8. Classify hog cholera, give symptoms and treatment.
9. Define epizootic aptha, and give symptoms.

10. Mention the names of the best beef breeds of cattle, and the best dairy breeds
11. Explain what is meant by ensilage and silo.
12. Name the five of the most important breeds of canines.
13. Name the various breeds of fine wool and coarse wool sheep, and state which breeds produce the best mutton.
14. When are animals properly quarantined?
15 What are blood diseases?
16. Give symptoms of mammitis, and treatment.
17. Give symptoms of parasitic bronchitis.
18. Give symptoms and treatment for splenic fever.
19. What is fardle-bound and how treated?
20. How would you treat parturient apoplexy?

OPATHALMIC DISEASES.

1. Name the coats of the eye, and the enclosed contents.
2. In what coat of the eye is the tapetum lucidum found, and what is its purpose?
3. What are "soot balls?" What is "wall eye?" What is the disease called "gutta serena?"
4. Describe the action of the "haw" and its uses.
5. Give treatment and symptoms of catarrhal conjunctivitis.
6. What is iritis? Give symptoms and treatment.
7. What is keratitis? What is leucoma?
8. What is filaria? Where found in the eye? The method of treatment.
9. Give the symptoms of irido-choroiditis, (moon blindness,) its progress, treatment operative and medical.
10. What is cataract?

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THE JOURNAL

OF

COMPARATIVE MEDICINE AND SURGERY.

VOL. II. JULY, 1881. No. 3.

ORIGINAL COMMUNICATIONS.

ART. XII.—THE EFFECT OF MUSCULAR EXERTION ON PROTEID METABOLISM—THE STANDARD RATIONS FOR WORKING ANIMALS.

THE effect of muscular exertion upon that continual decomposition and oxidation of matter in the body which is conveniently designated by the term *metabolism*, has been the subject of much investigation, and of not a little controversy.

Until within a very short time, however, by far the most abundant and trustworthy experimental evidence has favored the view that muscular exertion, while largely increasing the oxidation of non-nitrogenous matters in the body does not sensibly affect the proteid metabolism. Very diverse conclusions respecting the proximate source of muscular energy have been drawn from this fact, but the fact itself has been almost universally accepted as true. Some more recent investigations, however, seem to indicate that the experiments on which reliance has hitherto been placed may not cover the whole ground. These recent investigations, though not as yet very extended, have yielded some results of much interest, both to the physiologist and to the feeder of working animals, and some account of them may not be without interest to readers of this JOURNAL.

They were made by Kellner,* at the Hohenheim Agricultural Experiment Station in Wurtemberg, on a horse, and differed from earlier experiments chiefly in that the work was continued for a longer time, as well as in being performed on an herbivorous animal. In the experiments of Voit, and of Pettenkofer and Voit, the work was continued only for two or three days, at most; Kellner's experiments included periods of from one to eight weeks, during which the work performed daily (as measured by a dynamometer, constructed for the purpose) was constant. In all the experiments the quantity, chemical composition, and digestibility of the food eaten, were determined in the ordinary way, so that the amount and quality of the nutriment which the animal received were known, while determinations of the urinary nitrogen showed the amount of the proteid metabolism. No determinations of the amounts of carbonic acid and water excreted through lungs and skin could be made, but frequent weighing of the animal supplied their place in a measure.

The first series of experiments was undertaken primarily with a view of testing the effect of muscular exertion on the digestibility of fodder. The daily ration consisted of six kilogrammes (about twelve pounds) of oats, five kilogrammes of hay, and one-fifth kilogramme of straw. It was found that the amount of work performed had practically no influence on the digestibility of the feeding-stuffs employed, and this result was only confirmed by the subsequent trials.

In addition to this object, however, it was undertaken to follow the proteid metabolism in the several periods of the experiment. In the following table is given a summary of the results obtained, each number representing the average per day for the respective period:

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* London, Jahrbucher, viii., 701, and ix., 651.

SERIES I.

Period	Work performed. Kilogramme-metres.	Digestible Nitrogen of Food. Grammes.	Nitrogen of Urine.* Grammes.	Volume of Urine. C. C.
I.	475,000	134	99	6,730
II.	950,000	128	109	6,473
III.	1,425,000	133	117	8,106
IV.	950,000	126	110	8,686
V.	475,000	129	98	9,548

These results show plainly that the amount of proteid metabolism, as measured by the ureal nitrogen, varied with the amount of work performed; but before we can conclude that the latter variation was the cause of the former, there are two factors whose influence on the proteid metabolism must be considered.

First.—It is a well known fact that an increased excretion of water through the kidneys is accompanied by an increase in the excretion of nitrogen. In these experiments, however, as the table shows, the volume of the urine increased constantly from one period to another, so that this influence cannot well have caused both an increase and a decrease of the ureal nitrogen.

Second.—It is a well known fact that muscular exertion makes large demands on the store of fat in the body, and it is equally well established that the fat of the body tends to diminish the proteid metabolism.

If, then, severe work should diminish the amount of fat in the body, we might expect an increase of the proteid metabolism, while on a return to light work fat might be stored up again, and the proteid metabolism diminished. In these experiments, the live weight of the animals varied as follows:

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* In this first series of experiments the arrangements for collecting the urine were somewhat defective, and some loss of nitrogen probably took place, so that the amount actually excreted was more nearly equal to that digested. The general result in Series 1, however, was fully confirmed by subsequent experiments, more accurately conducted; and this. together with other facts, indicates that the loss of nitrogen was tolerably uniform in all the periods.

Average weight in Period I., 534.1 kilos.
" " " " II., 529.5 "
" " " " III., 522.5 "
" " " " IV., 508.8 "
" " " " V., 518.0 "

Since, as our first table shows, there was no loss of nitrogenous matters by the body, the loss of weight in the first four periods must have been caused chiefly by a destruction of fat, while in the last period a gain took place. As regards the effect on the proteid metabolism, however, we notice that in passing from the third to the fourth period the proteid metabolism fell off, while the loss of fat still continued. Furthermore, it was observed that in passing from a period of more to one of less work (e. g., from III. to IV., or from IV. to V.) the proteid metabolism sank *at once* to about the average for the latter period, while, if the effect were due to an accumulation of fat in the body it would have been gradual. We therefore conclude that the increase in the proteid metabolism in the second, third and fourth periods was a direct result of the greater amount of muscular energy put forth.

Having now considered at some length the first series of experiments, and the conclusions to which it leads, we are prepared to take up the subsequent confirmatory experiments more briefly.

It is a well known fact that during muscular exertion the demand for oxygen in the body is increased, while it also seems to be well established that the maximum amount of oxygen which the system can take up is dependent upon the amount of protein supplied in the food. It is therefore conceivable that in Series I. the food did not supply sufficient protein, that consequently not enough oxygen could be introduced into the body to set free the requisite amount of force by the oxidization of fat, etc., and that this deficiency was made good by the increase of the proteid metabolism. The supposition is not probable, but it is possible.

To test it, a second series of experiments was instituted, in which the protein of the food was considerably increased, while the amount of non-nitrogenous matters was correspondingly diminished, so that the total quantity of nutrients remained nearly the same. A day's ration consisted of 7.5 kilogrammes of hay and 4 kilogrammes of beans. The digestible matters in this and in the previous ration were the following:

	Protein. Grms.	(Nitrogen.) Grms.	Carbhydrates. Grms.	Fat. Grms.	Total Nutrients. Grms.
Series I.,	814	(130)	4848	200	5862
Series II.,	1367	(219)	3967	31	5365

This series included three periods, in the second of which three times as much work was performed as in the first or third. The following is a summary of the results per day:

SERIES II.

Period.	Work. Kilogramme-Meters.	Live Weight. Kilos.	Nitrogen Digested. Grms.	Nitrogen of Urine. Grms.	Volume of Urine. C. C.
I.	810,000	497	223	199	10,168
II.	2,430,000	471	217	224	11,650
III.	810,000	458	217	200	10,528

It will be seen that the effect of increased work was the same in this case as in the preceding, viz., to cause an increase in the proteid metabolism. It was likewise observed, as before, that the alteration in the proteid metabolism took place *at once* when the amount of work changed.

The only uncertainty arises from the greater volume of the urine in the second period. It seems doubtful, however, whether this could have caused the observed increase of the ureal nitrogen; and, on the whole, this series confirms the results obtained in Series I.

From the two together we learn, *first*, that the amount of food given in these experiments, while it was sufficient for rest or light work, was not sufficient when hard work was to be done;

and, *second*, that under these conditions not only the fat, but also the protein of the body, may be drawn upon to supply the necessary fuel for the lining engine.

Plainly such a loss of protein by the body is very undesirable in practice, and as plainly the way to prevent it is to supply more food. But of what sort shall this food be? Shall we increase the protein of the food, or its non-nitrogenous ingredients? The latter is much the cheaper course, and the facts already in our possession regarding the functions of the protein and of the carbhydrates and fat of the food would lead us to anticipate that it would be also the most effective, but nevertheless much interest attaches to the experimental investigation of this point, which was undertaken in a third series of experiments.

The plan of these experiments was the following: In the first period a light ration, containing beans as one constituent, was given, and a moderate amount of work was performed. In the second period, a part of the beans was replaced by an amount of oats containing the same quantity of digestible protein. In this way the digestible protein of the ration was kept constant, while the non-nitrogenous nutrients were considerably increased, owing to the larger percentage of them contained in the oats. At the same time, the amount of work performed was trebled, and the excretion of nitrogen followed as in previous experiments. In the third period, the amount of work performed was the same as in the first, while the food was continued unchanged from the second period.

The digestibility of the fodder did not correspond exactly with that calculated beforehand, so that the amount of protein actually digested in the second and third periods was a little greater than that in the first. The following were the amounts of the various nutrients digested per day:

	Protein. Grms.	(Nitrogen.) (Grms.)	Carbhydrates. Grms.	Fat. Grms.	Total Nutrients. Grms.
Period I.,	1085	(174)	5378	159	6622
Periods II. and III.,	1118	(179)	5531	245	6894

In the following table is given, in the same manner as before, the daily averages for each period:

SERIES III.

Period.	Work. Kilogramme-Meters.	Live Weight. Kilos.	Nitrogen Digested. Grms.	Nitrogen of Urine. Grms.	Volume of Urine. C. C.
I.	810,000	559	174	162	11,538
II.	2,430,000	541	179	174	10,023
III.	810,000	543	179	169	9,787

The great increase in the amount of muscular exertion in the second period was accompanied by only a slight increase in the proteid metabolism, and even this seems to have been due rather to the slightly increased amount of protein in the food than to the work. Moreover, it was observed that the ureal nitrogen was very constant in the second period, being 174 grms. per day in the first half, and 174.8 grms. per day in the second half, while in those experiments in which the work produced a decided increase in the ureal nitrogen this increase was progressive throughout the period.

It appears, then, that the addition to the ration of about 239 grms. of digestible carbhydrates and fat per day sufficed to prevent that increase of the proteid metabolism which we have reason to believe would have taken place without it. By comparing this ration with that of Series II., it will be seen that while it contains a much greater total amount of nutrients, it contains much less protein, the difference being made up by carbhydrates and fat. In Series II., 2,430,000 kilogramme-meters of work caused a decided increase in the proteid metabolism, while in Series III. practically no increase was caused. The difference can only be due to the larger amount of carbhydrates in the second ration.

On the diminution of the work in the third period, the live-weight of the animal increased slightly, and the proteid metabolism sank. Apparently the carbhydrates and fat which were applied to the production of mechanical effects in the second period, being no longer needed for this purpose, produced their well known effect on the proteid metabolism.

It will be seen that these three series of experiments have yielded results of much interest to science. In their consideration, however, certain things must be borne in mind. Investigations of this sort include many sources of error, and require the greatest care in order to give trustworthy results. Furthermore, so many conditions have to be taken account of and controlled, that while an experiment may be scientifically exact in theory, it must in practice be checked by numerous repetitions. That is to say, the method of inquiry which must be adopted in this branch of science is, to a large extent, the statistical method, and a single experiment is, at best, decisive only for the exact conditions under which it was made.

In drawing general conclusions from such experiments as Kellner's, then, we shall remember that they are, after all, but few in number, and shall regard our generalizations as only more or less *probable*, not as certain.

Kellner's results have an important bearing on the much debated question of the proximate source of muscular energy. This source has been found by physiologists of one school in the albuminoids, while those of another school have as positively located it in the non-nitrogenous constituents of the food or of the body. Kellner's experiments certainly seem to show that the organism has a greater power of accommodation in this respect than has been supposed. That the energy of muscular action is furnished by the decomposition of organic matter in the body is now a truism. When the supply of food is sufficient to balance the loss thus occasioned, the body remains *in statu quo*. If the food supply is insufficient, the materials of the body are made to supply the deficiency; and not only the fat, but, according to Kellner's experiments, the albuminoids of the body also, are attacked, so that under these conditions muscular exertion may increase the proteid metabolism.

If, to such a ration, a certain quantity of non-nitrogenous nutrients be added, this increase of the proteid metabolism is prevented, the carbhydrate and fat being decomposed instead of albuminoids. That is to say, under these circumstances the decomposition of non-nitrogenous matters may be a source of muscular energy.

But if Kellner's results are hostile to the views of those who, like Pettenkofer and Voit, see in the albuminoids the sole source of muscular energy, they by no means establish the opinions of those physiologists who look upon the body as the analogue of a heat engine, of which the albuminoids are the machinery, and the carbhydrates and fat the fuel.

In the first place, they show, if they show anything, that albuminoids may be decomposed in the body for the express purpose of supplying muscular energy. Furthermore, they do not show that a working animal does not need more albuminoid food than a resting one. The horse on which these experiments were made required about 400 grammes of albuminoids per day while at rest, to maintain his bodily condition; in these experiments he received from 800 to 1,300 grammes. Whether non-nitrogenous nutrients would have been able to prevent a loss of albuminoids had only 400 grammes per day been fed, may be doubted, but is a question yet to be investigated.

Finally, the results here described do not exclude the hypothesis that the non-nitrogenous matters yield up the potential energy which they contain through the medium of the albuminoids, according to the well known theory of Hermann, which need not be described here.

But these experiments have also an important PRACTICAL BEARING.

They show that when the food of working horses contains a reasonable amount of protein, what is needed when heavier work is to be demanded of the animals, is not more protein, but more carbhydrates and fat. Thus, for the oats of an ordinary ration, we should substitute, not some highly nitrogenous feeding-stuff like beans, but one rich in starch and fat, like maize.

The matter of the use of maize as food for horses is well worthy of attention, particularly for working horses. From a chemical point of view, and particularly in the light of the experiments just described, it is to be highly recommended, and several recent extensive trials of its use, on a large scale, for working horses, are reported to have given favorable results. It is to be hoped that the practicability of the more extensive use of this excellent and cheap grain, as food for horses, will be thoroughly tested.

Unfortunately, neither the recent Hohenheim experiments on the horse, nor the few previously made, have yet furnished sufficient data to render possible the construction of a "feeding standard" for working horses; that is, a statement of the amounts of digestible protein, carbhydrates and fat which the daily ration should contain to produce the desired effect most economically.

A fourth and fifth series of experiments were also performed by Kellner, the results of which may be briefly described. They were in part confirmatory of the previous results, and in part new.

In the fourth series it was attempted to ascertain how much useful work could be produced by the decomposition of a certain quantity of starch in the organism. In the first period a light ration of hay and oats (six kilos of each) was given, and the amount of work was so regulated as just to fall short of the amount required to produce an increase in the proteid metabolism. It may be safely assumed that this amount of work was the maximum amount that could be permanently performed on this ration. One kilogramme of rice starch was then added to the daily ration, and the amount of work increased until it again reached the maximum, as shown by the increase in the proteid metabolism. It was found that with the addition of rice starch about 538,000 kilogramme-meters more work could be performed than without it. Of the rice starch, 613.79 grammes were digested. This quantity of starch, according to the most recent determinations, would yield 2,749,165 gramme-units of heat, equivalent to 1,165,646 kilogramme-meters of work. Accordingly, of the total amount of force liberated in the organism by the oxidation of the starch, about *forty-six per cent.* was available for external work.

A fifth series of experiments was carried out in essentially the same way as the last, but with the substitution of linseed oil for starch. The result was that about *forty-nine per cent.* of the potential energy of the oil was available for external work.

We may say, then, according to these two results, that when to a ration sufficient to maintain the organism we add non-nitrogenous nutrients, about one-half of their potential energy is available for useful work. This result is, of course, only approximate, and is directly applicable only to the conditions of these experiments. Much more investigation is necessary before such a statement can be accepted as proved for all cases, and the interest of these experiments lies chiefly in their suggestiveness.

In conclusion, the writer wishes to call attention to one fact which shows that Kellner's results should be accepted with caution.

It is a well established fact that all the nitrogen which is excreted from the body is excreted either in the urine or fæces, and that in case no gain of flesh has taken place, the total nitrogen of these two is equal to that of the food. It is also tolerably well established that adult animals do not lay in flesh to any considerable extent. Now, in all but one of Kellner's experiments, the nitrogen of the food considerably exceeded that excreted, while at the same time the animal lost weight. These facts tend to raise a suspicion of some defect in the arrangement for collecting the excrements, and, at any rate, warn us not to accept the results too unreservedly until they are confirmed by further experiments.

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ART. XIII.—THE CAUSE AND CURE OF DISEASE IN HORSES' FEET.

EVER since the horse has been made the servant of man, efforts have been directed to the conservation of his feet, as upon their ability to withstand the wear to which they were subjected depended the usefulness of the animal. Before shoes were applied, the cultivation of a hardness in the horn, and a cupped shaped form of foot, were considered essential. Before the Christian era, Xenophen, the Athenian general, in some of his writings, gives particular directions in regard to the management of horses' feet. He says: "As attention must be paid to the horse's food, and exercise, that his body may be vigorous, so must care likewise be taken of his feet. Damp and smooth stable floors injure even naturally good hoofs. The floors should be made of irregularly shaped stones inserted in the ground, close to one another, similar to a horse's foot in size; for such stable floors give firmness to the feet of horses that stand on them." In treating of the duties pertaining to a commander of cavalry, he dwells on the necessity of attending to the horses' feet. "You must pay attention to their feet, so that they be in a condition to be ridden on rough ground, for when they suffer from being ridden they become useless." The trite saying of our own day, "No foot, no horse," is but the echo of these words of the ancient Greek historian. As the service required of the horse became greater, it became necessary to protect the horn from excessive wear, and shoes, or *solea,* as they were called, were constructed of various materials, such as straw, and skins of animals. In some cases horns were used for this purpose.

The date at which iron shoes were first applied to feet by nails is uncertain. Fleming, in his "Horseshoes and Horseshoeing," fixes it in the ninth century, and his researches in this field have been as exhaustive as those of any writer upon the subject.

According to the pattern of shoes shown in Fleming's work, in general appearance, though of ruder construction, they resembled our modern shoes, and fully answered the purpose intended, the protection of the hoof from excessive wear. From that time until the present, whenever horses have been subjected to the amount of labor for which their great strength and endurance adapted them, the iron shoe has furnished protection for the foot. In the newspapers of the day, we frequently read of attempts to use the horse without shoes, but such experiments are but going back to the custom which the ancients were forced to abandon. The wear, even with very moderate work upon our streets, would exceed the growth.

By the application of shoes, the hoofs were protected from excessive wear, and lameness from that cause prevented; but it soon became apparent that the application of shoes did not grant immunity from lameness, and to discover and remove the causes of lameness, and at the same time to properly and adequately protect the foot, has been the study and aim of horse owners, farriers and veterinary surgeons from that time to the present. Various have been the methods employed to accomplish these desirable results, but, comparing the literature upon the subject, ancient and modern, with my own observation, I am forced to believe that very little advancement has been made. In the sixteenth century, we have from the pen of an Italian the first treatise on shoeing, and in it are described forms of shoes which are in use to-day, and the same principles which Cæsar Fiaschi taught have been lauded in this century as new discoveries, which would revolutionize the whole system of shoeing. This treatise, written in 1564, forms the basis of nearly all the literature connected with horseshoeing. The various writers upon the subject since that time have advocated different methods of preparing the hoof for the shoe, and other details connected with the business, some believing that a free use of the knife was necessary, and others that very little paring was needed; writers differ also in regard to the shoe, some believing that lightness is desirable, others that a heavy broad shoe is necessary for protection; some that the bearing of the shoe should be limited to the wall, while others advocated its resting also upon the sole; some, that the frog should be made a weight bearer, and others that it was not designed for that purpose. Whatever theory was advanced, it was usually made applicable to all cases.

Contraction of the hoof has always held a prominent place in the causation of lameness, and scores of shoes designed to relieve this condition have been patented. In addition, various medicinal preparations for the prevention and removal of lameness have, from time to time, appeared, and yet our horses suffer from lameness. Lameness arising directly or indirectly from abnormal conditions of the feet, is the prominent symptom in the majority of cases which are brought to the veterinary surgeon for treatment. There seems to have been no mitigation of the evil, but rather an aggravation of it in modern times. This condition of affairs has suggested to the writer these queries:

First.—Have the true causes of lameness been made prominent by writers upon the subject?

Second.—How shall the horse's foot be perfected and preserved?

In reference to the first query, I feel justified, after an extensive acquaintance with the literature upon the subject, coupled with the experimental knowledge gained by many years' experience in the shoeing and management of horses' feet, in answering this question in the negative.

I shall not attempt to point out all the causes of lameness, but shall endeavor to make clear what I consider to be the most frequent cause.

To do this it will be necessary to refer to the construction of the foot. The foot of the horse is formed by the enclosure of the last joint of the extremity in horn, and it must be evident that a certain height of horn is required upon each side, and at the toe and heel, to place the joint enclosed in its right relation to the bone immediately above it.

This horn is attached by means of the laminæ, which ensure a strong and elastic union. At the superior internal border is the coronary concavity, which lodges the horn-producing tissues, and changes in the bearing of the foot interfere with the function of this part, modifying the secretion of horn. Through its laminal attachment, the bone is suspended within the hoof, and is surrounded by about three-eighths of an inch of highly organized and sensitive tissue. That these tissues be not injured either by pressure or tension, it is necessary that the right relation of the different parts be maintained, and it is the disturbance of this relation which is the primary cause of the diseased conditions of the foot. Thus, when the hoof becomes so changed in form, or the position of the pedal bone altered in its relation to the hoof, so as to bruise the tissue lying between the wings of the bone and hoof, it produces that redness at the heels popularly known as corns. This redness in the plantar horn is frequently seen at other parts of the sole, but wherever seen is produced in a similar manner. Excessive and unequal pressure at the coronary concavity is a very common condition to be found. The inside border is more likely to suffer than the outer from this cause, and it always results in a modified secretion of horn, the hoof becoming thin and subject to fissures. In a similar manner, diseases of the lateral cartilage arise, and a tendency to lammitis and navicular disease is developed.

I have in my possession a foot and leg of a horse, which presents some changes in the relation of hoof and parts enclosed, with some of the effects of the same. To prepare the specimen I removed the skin from the leg as far up as the knee, and hung it up to dry. About a year afterward I examined it, and found the soft tissues surrounding the pedal bone all removed; although externally the foot presented the same appearance as when it was hung up. I removed sections of the horn from superior to inferior borders, large enough to permit of examination without disturbing the relation of the parts. The hoof was turned to one side by unequal growth, but the bones had endeavored to preserve the straight line, and, as a consequence, the wall was quite close to the bone upon one side, and quite removed from it on the other. Upon one border of the plantar surface the bone rested upon the sole, while from the other it was unduly elevated. Where the bone rested upon the sole, the sole was extremely thin. At the coronary border the pressure was greatest at the inner quarter, and as a consequence the wall here was thinnest.

We can imagine the suffering which must have accompanied these changes. This case, although an aggravated one, is not exceptional. The horse was young, had been purchased as a sound horse less than a year before, being put to work on a cart for which he was suited. At first an awkward gait was noticeable—an uneven wearing of the shoes—later, tenderness in the feet, which eventually increased to such extent as to be recognized as lameness. This lameness was not excessive at any time, and would have been accounted for ordinarily by the owner in various ways, such as *general* abuse by the driver, excessive feeding, watering when heated, driving shoes on too tightly, hot fitting, applying a shoe too small to protect the foot, etc., the true cause of the lameness being entirely overlooked. I mention this case as illustrative of what I conceive to be the most prominent cause of lameness, *viz.*, *a lack of harmony in the relation of the different parts comprising the foot.* All feet are more or less affected in this manner. The condition seems almost inseparably connected with the artificial surroundings of the horse, but if generally recognized as the *source* of lameness, efforts will be directed towards mitigating the evil. All horses, it is true, are not lame. Some are less sensitive than others; but a better reason for such exemption is that some feet, from their form, are less susceptible to injury than others, from changes in the foot. These changes, although they may not be sufficient to produce that irregular motion recognized as lameness, yet they do interfere with that regular, steady, machine-like action which the horse, perfectly balanced upon his feet, will exhibit. Interfering, overreaching, excessive wear of the shoe at the toe, or upon one side, or at the heels, standing with the feet too far forward or backward, are all indications of a lack of balance or harmony between the parts. If these are facts, they are such as every horseshoer and veterinarian should be familiar with. They should be able to know from an examination of the foot just the condition of the parts within, and the best course to adopt to preserve the foot if perfect, and restore to health if diseased.

It will be admitted that this knowledge is not possessed by the majority of horseshoers.

With many the perfection of the art consists in paring out the sole smoothly, the selection of a shoe which suits the fancy of the owner, modifying it to fit exactly the outline of the foot, driving the nails evenly, and finishing off with most artistic filing of the hoof, with no thought whatever as to whether there is equal pressure at the coronet, or to the position of the joints which make up the limb.

In securing these ends, it will frequently be found necessary to change the form of the shoe from the ordinary shape, in some instances making the heels thick, and in others thin. And the same holds good in regard to the side, one may be thicker than the other. These rules are applicable not alone to the old and diseased, but to all ages. Colts that are shod for the first time often exhibits as great defects as any.

To recapitulate: *the most frequent cause of lameness is a disturbance of the relations of the parts within the hoof, and to preserve the foot it is necessary to secure and maintain all parts of the foot in their normal relations.* This is the fundamental truth which should direct all efforts for the preservation of the foot. If this is not secured, friction and disease are sure to follow.

If these principles are true, and so essential, it follows that any treatise purporting to teach the business of horseshoeing should seek to enforce these primary facts, and following this, that the different forms of feet should be illustrated, and the abnormal conditions within the hoofs most likely to be developed from the peculiar form of foot presented, together with the best method of defeating that tendency and preserving the foot, be fully explained. If the books which have been written to teach that the whole art of horseshoeing is embraced in preserving the frog from the knife, and allowing it to reach the ground, had enforced these truths, or, if the effort expended in illustrating the idea that all lameness was due to a too free use of rasp and knife, had been expended in behalf of these fundamental facts, horseshoeing might now be what it is not, the conservation of the foot, rather than its destruction.

Second.—How shall the horse's foot be perfected and preserved?

If we are ever to have perfect feet, we must begin and develop them. A recent writer has said, "No two peculiarities of the horse are more unerringly transmitted than the eyes and feet," a fact confirmed in my own experience in numberless instances. This is a fact which every man should keep in mind in selecting animals to breed from.

Opinions differ as to what is a desirable form of foot. My own is that the mule-shaped foot is the best, the one least likely to change its form with age and shoeing. One point that I consider most essential is, that the heels should be long posteriorly, that this elastic portion of the foot should be well developed• The short-heeled foot (by shortness I do not refer to the height of horn, but to its length posteriorly), wider across the quarter than it is long, is particularly undesirable. This form is liable to change, and these changes are more quickly followed by lameness than in the long-heeled form. This difference between the long and short heel can be explained in this manner: There is a tendency in the hoof shod to develop anteriorly, and to become less and less posteriorly. This carries the bearing surface of the foot further forward, and places it at a disadvantage in supporting the weight of the animal. A foot that is short in the heels is already too much developed at the toe. Again, the hoof is likely to become narrow in the heels, from a variety of causes which we will not stop here to enumerate. If the heels are long, this condition scarcely affects the gait of the horse, but if short, the contraction will be hardly perceptible before lameness will be produced.

As soon as the colt is born, the care of its feet should commence. Almost all writers upon the subject seem to agree that the surroundings of the colt have very much to do with the shape of the feet, *i. e.*, if i tis raised upon dry ground its feet incline to be narrow and hollow, and if on wet soil to be wide and flat. These forms are modified by inheritance. Moist conditions are undesirable, as producing the width and consequent shortness of the heels.

Whatever shape is considered desirable should be cultivated by intelligent use of knife and rasp, or even by the application of shoes, where there is a tendency to spread too much at the plantar surface. During the winter season, when the growth exceeds the wear, they require frequent use of rasp. In summer the wear is sometimes uneven, and this must be regulated.

If, with this object to be attained, a judicious selection of sire and dam has been made, if the circumstances attending the growth of the colt have been favorable, as a result we shall have a perfect foot, which, if not abused, will last as long as any other part of the animal, that is to say, from twenty to thirty years.

Feet, then, are to be perfected by the cultivation of a perfect form, and they are to be preserved in shoeing by such intelligent use of knife and application of shoes as shall maintain the right relation between all the parts of the foot and limb, thus securing the proper physiological function of each part, and giving to the horse that bold, even, graceful stride which is pleasure to the animal and the pride of his owner.

This article has already exceeded the limit intended, and we leave for some future occasion further reference to the care of the feet in the stable in sickness and health.

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ART. XIV.—ON THE LESIONS AND PATHOLOGY OF THE SO-CALLED POSTERIOR PARALYSIS OF THE HORSE.

POSTERIOR paralysis is a subject of great interest to the equine practitioner and horse owner, both from its great frequency and fatality. In works on veterinary practice it is apt to be associated either with "spinitis" (Williams) or azoturia, but in either case the pathology of the affection is more or less obscure.

Undoubtedly, in a few instances the exciting cause may be traced to a fractured spine, or possibly even to vascular changes, such as occlusion of the iliac arteries, from embolism or thrombosis; but these exceptional conditions are of no account in explaining the occurrence of the disease as we usually find it in practice. In the case of a fracture there may be some show of reason for calling the affair, as Williams does, a "spinitis" (a word of vicious construction, part being Latin and part Greek), which really can only be translated so as to mean an inflammation of the bony canal. But it cannot be applied to any other pathological process, and therefore is absolutely incorrect when used to indicate a meningitis or myelitis, or both. The impropriety of assuming a spontaneous origin of the disease is further shown by examining the causes that are given for the human disease.

These are either direct injury, the extension of an inflammation from contiguous parts, syphilis, venerial excesses, hemorrhage, etc., while spontaneity is rather inferred than affirmed, and then only in a small proportion of the cases. Is there, then, any special reason why one should believe that the disease is primary or idiopathic, and has no cause that we can explain, or is it not probable rather that a well-directed and intelligent search will reward us with its discovery?

Azoturia is another one of those convenient words which has a useful place in mystifying, but not explaining, the real condition of things. Posterior paralysis is spoken of as dependent on " nitrogenous urine," and a " hyper-nitrogenous " condition of the blood, but from physiological laws the opposite condition might often be expected when an animal, as is generally the case when paralyzed, has been at rest and fed upon a vegetable diet. The pathology of the disease, as heretofore given, is thus seen to be in a very unsatisfactory state.

Posterior paralysis is classed in various ways by different writers. Thus it is called sporadic or epidemic, according to a common division observed in infectious diseases. It is also acute or chronic. An attack is usually sudden, frequently after exposure to a sudden change in temperature. Mares are more frequently attacked than geldings, and it is apt to occur at the period of œstrum.

So far as personal experience goes, derived from a number of autopsical examinations, in cases where the existence of the disease had been established clinically by others, it leads me to the belief that serous or purulent exudation, which is the marked phenomenon where serous membranes have been inflamed, is not to be found in this disease. It is true that I have seen in some instances a marked turgescence of the vessels in the membranes of the cord, and some fluid in the subarachnoid space, and there is in some instances vascular distention of the vessels of the cord in the lumbar region. I believe, however, that these conditions indicate an active congestion or hyperaemia, with subsequent transudation of fluid, rather than an established inflammation. I must, therefore, decide from my experience that the pathological changes in those cases, except in the rare instances already alluded to, are a marked congestion of the spinal membranes lying in contact with the lumbar portion of the cord, and of the cord itself at this point. The congestion may extend along the membrane covering the roots of the spinal nerves up to the point where they penetrate the dura-mater, *where it is most intense*, and looks as if it might produce considerable pressure on the nerves. The dural layer of the arachnoid, and the pia-mater, do not appear to be congested.

In the lumbar and sacral regions, the former especially, I have found the surface of transverse sections studded at varying intervals with bright red points, and lines marked in the gray columns, both indicating vascular engorgement.

Microscopical examination of these areas revealed distended capillaries packed with blood disks, while occasionally little extravasations occurred about the vessels. It seems highly probable that, during life, an œdematous condition of the cord at this point may also accompany the congestion. The changes are most marked, as I have said, in the lumbar region; it is slight in the sacral, and absent altogether in the dorsal and cervical portions of the cord.

It is noteworthy, too, that all the cases which came under our observation exhibited extensive lesions in the genito-urinary tract. The mucous membrane of the bladder was inflamed, and often coated with a thick, ropy mucous; frequently there was an abundant loss of substance, resulting in ulcers of varying size and shape. Sometimes the inorganic salts, principally the lime carbonates, were deposited and intermixed with the ropy mucous, so as to form a pasty mass like clay. If such a case terminated in recovery, a stone in the bladder might fairly be expected, for it seems hardly possible that the bladder could rid itself unaided of so firm and large a substance.

The ureters also are congested, and sometimes inflamed, and occasionally dilated. The pelves of the kidneys frequently contain purulent fluid, the mucous membrane being congested and studded with bright red, ecchymotic spots.

The kidneys are found either hard or soft, but always very dark in color. The capsule often non-adherent, the underlying renal surface smooth but deeply congested. When the kidneys are laid open, the cut surface is dark in color, with bright red lines running in the direction of the collecting uriniferous tubules of the pyramids. The congestion is most marked in the pyramidal portion. A bloody, tenacious fluid may be seen to exude from the cut surface, which coagulates rapidly into white, flaky masses upon the addition of alcohol.

Microscopical examination shows that the most marked and constant lesion is that of an acute parenchymatous nephritis. The epithelium is swollen, cloudy, or even granular; in many places the cells are entirely stripped from the basement wall. Sometimes the interstitial tissue is slightly involved, but this is not a constant appearance. The blood-vessels are not specially distended with blood corpuscles, but numerous blood disks are to be seen scattered through the section; some pigment matter probably from the blood, is also quite abundant.

Sero-sanguinous effusions into the lumbar muscles are met with in some of the cases. In one animal there was considerable bloody effusion into the peritoneal cavity; this latter, however, was noticed in a mare at the period of oestrum, and may be regarded as an exceptional case. This hemorrhage into the peritoneal or pelvic cavity is similar to the pelvic hematocele occasionally met with in human practice. This hematocele may have been only an accidental complication.

The kidney lesion was marked in all the instances observed, though the spinal congestion was at first, if present, entirely overlooked.

The question now arises, which lesion is primary, and how can its production be explained?

To us it seems quite evident that the renal disease is secondary or complicating, and the spinal congestion and oedema the primary lesion. One reason for this view is the fact that the paraplegia almost invariably develops first, and the urinary symptoms show themselves later. Proof of this statement appears especially strong in a case reported in the Case Department by Dr. Parkinson. The paralysis of the bladder, with urinary retention, but at first no marked changes in the urine, point, it seems to me, to the spinal lesion as the primary trouble. If the renal disease was primary, it would seem reasonable to suppose that some renal symptoms would be detected prior to the paralysis. Again, if the spinal congestion was secondary, why should it be localized in the lumbar and the sacral regions, and the rest of the cord remain normal; more especially if, as is claimed, it is due to the retained products of tissue metamorphosis?

It is hard to understand how the condition known as azoturia can produce the posterior paralysis and nephritis. It may be possible that a condition of the blood exists with this disease which produces spinal congestion and nephritis. It does not seem very clear, however, how a "hypernitrogenous condition of the blood" should produce nephritis, for the amount of work to be performed by the kidneys is subject to constant variations. It is barely possible that a surcharging of the blood with effete material may irritate the spinal centres in this region, and thus produce congestion, oedema, paralysis, and nephritis; but why the lesion should be located at this given point is the puzzling question; for in human medicine, when the kidneys give way, and the products which should be excreted are retained, and the cerebral as well as the spinal centres are implicated.

The question arises in our minds if there is not a better way to explain the cause of these attacks. The sudden work required of the posterior extremities after rest produces an intense reflex irritability of the spinal centres supplying them, which is speedily followed by congestion and oedema, paralysis, and all its disastrous results. During the period of œstrum, there is probably some irritation of the spinal centres at this point, and a very little increase of this irritation may produce a decided congestion. The application of cold when under exercise seems sufficient to bring on the lesion. In all the cases active exercise of the posterior extremities appears essential to the production of the paralysis, for at rest these attacks never occur. Sudden exercise after rest, calling out the activities of the posterior cord, especially in cold weather, and during the period of œstrum, seem to be almost enough factors to explain the production of a spinal congestion and œdema.

The symptoms are not always the same during the period of invasion, so that we have several types or sets of cases of the same disease.

One set of cases is met with in mares at the period of œstrum, especially if the animal be taken out and worked after a few days of rest. If the first day be wet or cold the greater the danger. Such an animal, you will notice, suddenly becomes weak, and staggers in the posterior extremities only; finally, there is complete loss of motion and sensation. The lumbar regions often swell up, and the extremities are sometimes cold. The pulse rises from 20 to 30 beats per minute; respiration becomes frequent and jerking; the temperature rises one or two degrees; sometimes as high as 105° or 106° F. After an hour or so, the animal strains and ejects a large quantity of dark, coffee-colored urine, which contains a large admixture of blood. It also perspires freely. The intensity of these symptoms frequently abates in 24 or 36 hours, and the animal appears to be on the road to recovery, but at the end of a day or two it dies; less often it may linger a week or more. The cause of death is exhaustion or suppression of urine, with uræmia. Sometimes recovery takes place, but the posterior extremities remain quite weak.

A second set of cases is met with both in the mare and gelding after the animal has been stabled for a few days, and then taken out and driven. To this class the name *azoturia* has been applied. The animal may be unusually spirited, and make the first few miles without showing any debility, but suddenly it appears weak in the posterior extremities, staggers, becomes restless, perspires freely, and eventually manifests a strong desire to lie down; then loss of motion and sensation is apparent, though there is often for a time spasmodic muscular contraction. The pulse rises to 60 or 80 beats per minute, and respiration is increased in frequency. When the paralysis is complete they often try to rise, but fail to get upon their feet. After straining violently, they void at intervals large quantities of dark, coffee-colored urine, containing blood. The intensity of the symptoms may subside for a time, but often the quantity of the urine gradually diminishes, and they finally die from suppression. Ultimate recovery is also rare in this form.

A third set of cases is seen after exposure to cold and wet, and therefore most frequent in the fall and spring, when cold rains are common. Similar attacks may occur in summer, when the animal has been out in the hot sun, and is suddenly caught in a thunder shower, the rain falling upon the previously heated loins. After such exposures the animal suddenly, or at the end of a few hours, becomes weak, staggers, and loses power of motion and sensation in the posterior extremities. In some of these cases there is a copious discharge of dark-colored urine, in others there is suppression from the first. The temperature, pulse, and respiration rise, accompanied by great restlessness, glassy eyes, and in some cases swelling over the loins. In these cases the bowels are usually constipated.

In a fourth set of cases the symptoms come on more gradually, several days even elapsing before they are fully established. Such an attack is well depicted in the case reported for this issue by Dr. Parkinson.

In a fifth set of cases the disease is epidemic, several animals being attacked in the same stable, town or city. Or the epidemic may travel from stable to stable, town to town, or city to city.

These remarks are thrown out more as an incentive to veterinary surgeons to study this disease with these lesions in view, than to give a final classification; but the comparatively few cases which we have had the opportunity of closely examining have revealed the lesions already given, a knowledge of which, if our view of this disease should prove true in all cases, will suggest a plan of treatment which may restore many animals afflicted in this way to perfect health and strength.

As these examinations have led us to believe that the primary lesion is a congestion of the lumbar region of the cord, its membranes, and the spinal centres, with possibly œdema, which may be followed by myelitis, all spinal stimulants should be strictly avoided. Motor and spinal depressants, and specially those which tend to diminish the spinal irritation and congestion, should be resorted to. Physostigma Venosum, ergot, chloral-hydrate, bromide-salts, and the like. The free and early use of ergot and chloral-hydrate will probably be followed by the best results, the ergot being the best of the two.

At the same time, the kidney lesion should not be neglected, but occupy our close attention, and be treated by free purgation, diaphoretics, and non-irritating diuretics, as large draughts of water and digitalis. For it appears to the writers that many of these cases eventually die from suppression of urine, uræmic convulsions and coma.

Again, special attention should be paid to the bladder, for in a number of these cases we have found a tendency to cystitis, ulceration of the mucous membrane, and the formation of calculi. The bladder, therefore, should be thoroughly washed out at least twice a day with tepid water, containing some bland disinfecting solution, or the following can be used:

℞—Boracis, ʒ i.
Glycerin, ℥ ii.
Aquæ, ℥ iv.
M

Sig.—Add one ounce of the above mixture to one quart of tepid water, and thoroughly cleanse the bladder, after the urine has been drawn with a catheter. Hot fomentations over the loins may be of service, if the quantity of urine is small, but, better still, dry cupping. Cupps are hard to apply to horses; but they can be applied, and quite effectually, too, provided the hair has been previously cut close to the skin. Diaphoretics may be resorted to. As soon as the animal shows any signs of improvement, slight exercise on level ground should be instituted.

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EDITORIAL DEPARTMENT.

SHALL OUR HORSES WEAR SHOES?

THERE has recently appeared in a leading English monthly an article by Sir George Cox, in which he advocates the plan of letting our horses go unshod. This is, of course, no new idea, but it is now advanced with much specious reasoning by a person whose experience enables him to speak with some authority. The article in question has been very widely circulated and commented upon.

As the question of shoeing or not shoeing is the most vital of all to the health and usefulness of the horse, we propose to review it now at some length. No veterinarian can afford to be without a clear and positive opinion on the matter.

It has been the custom with writers upon the subject of shoeing to class it as a necessary *evil.* We think that this is a mistake. Although the application of shoes is in some instances undoubtedly followed by bad results, yet we believe that the proper adjustment of the horn, and the application of a suitable shoe, is on the whole beneficial, for various reasons.

First.—Because it prevents the undue expansion of the wall at the plantar surface.

So much has been said about contraction, that the idea that the hoof may be deformed by expansion may seem improbable, but that such is the case is not an open question. The rearing of an animal of great weight upon moist soil causes the hoofs to assume this form, as witness the feet of most of the Western horses. In these, the wall presents a concave surface externally. This form of wall places the laminal attachments at a disadvantage in sustaining the weight of the animal; the *lateral* *tension* upon the lamina is excessive; the wall in these flat feet is rendered more susceptible to this lateral pressure by the thinness of the sole.

Such a foot as we have described would be greatly benefited by the application of shoes at an early age. This would prevent the spreading of the hoof, the shortness of the heel, and the thinness of the sole, which will not permit of the use of the animal for one day upon our pavements without suffering from lameness; a fact which is well known to the drivers of such animals.

Second.—Shoeing is advantageous because it aids in securing and maintaining the foot in its right relation to the limb, and in fitting the animal for the particular work demanded of him.

Whenever horses are driven for any considerable time without shoes, uneven wear of the hoof is observed. As a rule, this excess of wear is greatest at the outside toe, causing the foot to turn in, a condition indicated by the horseman's phrase "pigeon-toed." These results from the using of horses without shoes have been noted by ancient writers upon the equine foot. In the thirteenth century, a certain traveler, speaking of the Tibetan ponies, which were strong and enduring, and as unlikely to be injured in this manner as any, says, "They are never shod, and the hoof often cracks, and they become pigeon-toed."

Lolleyel, the eminent veterinarian of France, in the seventeenth century, writing of the unshod horses of the German peasantry, says that in nearly every case he found the limbs and feet more or less deformed. These observations are confirmed by many other writers. This uneven wear of the hoof is injurious. It changes the normal bearings of the joints, exciting disease in them. It interferes with the nutrition of the foot. It hinders the development of speed, because the horse requires to be perfectly *balanced* upon his feet to maintain rapid action. For this condition, the application of shoes is an efficient remedy. Iron can be applied to the hoof in such shape as will correct any defect in its form, and when worn can be renewed. The more uneven its wear, the more necessary a frequent renewal.

In reference to the fitting the animal for the work demanded of him: if it is speed that is desired, every trainer knows the efficiency of certain forms of shoes for its development; if for draft, slight calkings vastly increase the animal's power; and if for winter work in countries where much ice is formed, sharp calkings are absolutely indispensable to the horse obliged to pull even a moderate load.

Third.—Shoeing is a necessity, to prevent destructive wear of the hoof.

The hoof of the horse, although well enough adapted to withstand the wear incident to the undomesticated condition of the wild horse, is soon worn when forced to travel constantly over our artificial roads. This has been the experience of the world in this matter, and hence the necessity for some protection for the foot, and the iron shoe fastened with nails is the most efficient method yet employed.

The above are, in brief, the principal reasons for advocating the use of shoes.

In the face of these reasons, however, Sir George Cox, after recounting the great variety of shoes in use, and the many evils that come from bad shoeing, characterizes the shoeing of horses as a "wrong-headed and ridiculous system."

He makes this a rule without exceptions. He takes in the whole equestrian field, and makes no allowance for kind of foot-service required or nature of the ground and climate. He gives a few examples of the use of horses without shoes, which he evidently considers sufficient to establish his theory. He seems to have based his conclusions largely upon the experience of past ages, where the circumstances which might assist in determining the question are necessarily difficult to obtain. We select a few of the instances which he gives. The first is of the small, hardy horses of Mexico and South America, that carry packs and make, as he says, "long journeys unshod without injury to their feet." This certainly is no practical test. If the animals carried packs their pace was doubtless a slow one, and opinions might differ as to what constituted an injury. A second instance is the march "of the Cyrean army under Xenophan from the plains of Babylon to the shores of the Euxine," and "from Cunaxa over the

Armenian highlands to the walls of Trebizond; yet we hear nothing of any special difficulties arising from diseases of the foot or leg." These instances are given without the information in regard to the nature of the soil traversed, the season of the year, or service required of the horses, necessary to the forming of a correct estimate of their value. The march might cause the feet to be excessively worn without producing "any special difficulties arising from diseases of the foot or leg."

Another instance which he gives is "the retreat of the French from Moscow." "The horses," he says, "lost all their shoes before they reached Vistula, yet they found their way to France over hard, rough and frozen ground." Of this campaign, history furnishes these facts, viz., that of the 400,000 men of the invading army only 10,000 returned. How many horses "found their way to France?" How they returned to France is thus described by M. Thiers: "Napoleon left on the 6th of November, the army following on the 7th and 8th. The cold had become perceptible, and gave rise to painful regrets at having forgotten to provide winter clothing, and another neglect yet more baffling, that of procuring *frost nails for the shoes of the horses.* Our unfortunate soldiers marched along wrapped up in every kind of clothing saved from the flames of Moscow, and at each ascending portion of the road the artillery horses, even when the usual number required was doubled and trebled, were unable to drag the guns of the smallest calibre. Flogged until they were covered with blood, and their knees torn with frequent falling, they were found incapable of overcoming ordinary obstacles through loss of strength and want of means to prevent slipping on the ice."

Again, the donkeys of Ireland are instanced as animals working successfully without shoes, and the superiority of the horse to this animal in speed and strength is, he thinks, a sure indication that the feet are also superior. He says: "Can one really believe that the animal which is endowed with the greater speed and power should have worse feet than his inferior in both respects?"

This statement needs no refutation, as a very slight acquaintance with the feet of the respective animals will serve to show the superiority of the donkey's. They are thicker in the horn, more concave in the sole, and sustain less weight. Other instances are given of the ability of the foot to withstand wear unprotected by the shoe, but it can be said of them what can truly be stated of those already given, that they are not practical tests.

This theory of Sir George Cox is, as we have said, no new one. Men who, like him, have made the mistake of attributing all the diseases of feet and limbs to shoeing, have also, like him, sought to avoid these evils in a similar manner. But these theories, when subjected to a practical test, have always been found wanting.

It is true that when the animals are small and the feet well formed, with light work in an agricultural district, this method can be employed with tolerable success.

The wear and tear to which we subject our horses to-day is greater than at any previous period. If the smaller and hardier breeds of the ancients were unable to stand this wear without some kind of protection for the feet, how absurd is the idea of subjecting our larger and more delicate-formed animals to such a test over our city pavements in this fast age!

Some of the largest horses in our cities wear out a shoe weighing from four to six pounds in a month. Think of the attrition to which such a hoof would be subject! Even in the country, where feet are well-shaped, continuous use upon the road for a very short time will render them sore in the feet.

No owner of a flat-footed horse need be told of the advantages which shoeing confers. No teamster need be told the difference between the pulling power of the shod and the unshod horse. No experienced horseman but knows the difference between the bold, free, graceful tread of the well-shod horse and the hesitating, "tied-up" gait of the barefooted one. E. A. M.

THE NEW COMMISSIONER OF AGRICULTURE.—There has been a most uniform commendation of the course of the President in appointing Dr. Loring Commissioner of Agriculture. Dr. Loring was the man who first cleared Massachusetts of pleuro-pneumonia, an act which alone would entitle him to the highest public gratitude and respect.

We believe that veterinarians will heartily join in the general approval of this appointment. From our knowledge of the interest which the new Commissioner takes in veterinary science, we feel sure that he will do what is possible to secure its advancement, appreciating, as he must do, its importance to the agricultural and commercial interests of the country.

We may reasonably expect that the efforts at investigating contagious diseases will be more intelligently directed than has heretofore been done. It is certain that the wretched stuff put forth as pathological work, by the late Commissioner, cannot be imposed upon his successor.

Every one will now be ready with suggestions for the new officer. One of these is, that he establish a Veterinary Bureau which shall investigate contagious diseases among animals, and which shall organize the means by which a knowledge of the prevalence of these contagious diseases can be obtained. Bulletins from such a Bureau would have authority and value beyond any possible unofficial announcements.

DOCTORING THROUGH THE NEWSPAPERS AGAIN.—The *Live Stock Journal* has chosen to criticise our remarks in a previous issue on "Doctoring through the newspapers." If the journal in question had read our editorial more carefully it would have found that there was less difference of opinion between us than it supposes.

We did not belittle the efforts of the veterinary editors of the various stock and agricultural journals. On the contrary, we stated distinctly that so far as we had seen these journals they were ably edited, and that the best was made of bad method.

Neither did we condemn the practice of doctoring through the newspapers utterly. Such methods we said, in very much the language of our critic, must be adopted for the present, because good veterinarians are few. But we do insist that the practice is intrinsically a bad one, and ought to be abandoned as soon as it can be done with advantage. What possible accuracy in diagnosis can be obtained by the descriptions of untrained persons utterly ignorant of disease? And what certainty of treatment or what progress in veterinary science can be thus secured? We accept the practice as a necessity just now; but we assert again that veterinarians should allow it only a provisional endorsement. It will be equally for the interest of the profession and the pubilc that a veterinarian rather than the papers should be consulted whenever possible. We cannot agree either that such a book as that of Dr. Law's or of Dr. Navin's is not worth the paper it is printed on. A careful study of such works as these would often be of more value than the vague advice in veterinary departments.

PREVENTING DISEASES BY INOCULATION.—The number of articles and comments upon the subject of preventing or stamping out contagious diseases by inoculations has been, of late, quite considerable. It shows that the remarks made upon the subject in the JOURNAL OF COMPARATIVE MEDICINE were very timely.

The following seems to be about what has been accomplished in this direction so far. The efficacy of inoculation in checking pleuro-pneumonia has been established in Holland, and a prominent veterinary journal in England urges its adoption in that country.

Pasteur claims to be able to prevent chicken cholera by inoculating a modified virus. Burdon-Sanderson and Greenfield, of the Brown Institution, England, claim that they can obtain an efficient "vaccine matter" for splenic fever by cultivating the virus in guinea pigs. Davaine claims similar results by treating the virus in a different way.

Koch and others have succeeded by inoculation in protecting animals against certain septic infections. Grawitz, of Vienna, has succeeded in preventing the toxic effects of certain moulds by previously inoculating the animal with cultivated virus.

There is a suggestive communication on page 193, from Dr. Wesley Miller, of this city, who claims nothing less than the possibility of preventing scarlet fever, and perhaps tuberculosis, by inoculating the cultivated virus of allied diseases existing in the lower animals.

Certainly the field of comparative pathology is rapidly widening. The veterinarian should remember that here he can secure the greatest scientific triumphs. All that is needed is ambition and industry.

THE VETERINARY MEDICAL REGISTER.—In response to a circular, published on another page, we have received a large number of names of veterinary practitioners. These have been arranged alphabetically, and are printed in the news department of the JOURNAL. We are under obligations to a number of agricultural and medical journals for publishing our notice, and also to veterinarians for responding to it so promptly. It confirms us in our opinion of the usefulness of such a register.

The time allowed us for the compilation of the names already secured was too short to make the list complete. We shall, therefore, issue a supplementary list which will include all names sent to us after date of writing and before the next issue. The two lists will form a very complete register. We urge every veterinarian who has not done so to send his address, degree, if any, with the college which gave it, before the fifteenth of September next. To those who do thus send their names we will forward the list on receipt of three-cent stamps. Others can obtain them by forwarding nine cents for the first list and twelve cents for the two lists.

BREEDING IN ITS RELATIONS TO PHYSIOLOGY AND PATHOLOGY. —The exact connection between comparative medicine and the very healthy Jersey cow, pictured on page 198, may not be at first apparent. But we are of the opinion that breeding, when scientifically investigated, will reveal much to the physiologist and pathologist. Breeding has already been well studied empirically. The art is well developed and perfected; the science, too, has been studied in certain limited directions by naturalists. But on the whole the correlative, physiological and pathological processes are very little understood. We hope to obtain a series of articles bearing on this aspect of the subject; especially with reference to its pathology and the physiological limits to which breeding can be carried.

The Jersey cow illustrates, as well as any animal, what breeding can do to develop a special function. The difference between the ordinary cow and a typical Jersey, as regards the size and activity of the mammary gland, is immense. Some of the best cows look actually deformed. Yet the limit of this glandular development does not seem yet to be reached. At the present rate it seems not unlikely that in time the udder will carry the cow instead of the cow the udder!

PHAGEDÆNA—IS IT A NEW DISEASE?—We call attention to the very interesting description of the disease which has been epidemic among the horses of Cincinnati, Chicago, and other Western cities. Dr. Bowler is inclined to think that it is a new disease. It does not seem necessary to suppose that there is any new specific infection acting as a cause.

CASE DEPARTMENT.

COLUMBIA VETERINARY COLLEGE HOSPITAL.

REPORTS OF CASES UNDER CARE OF FRANK WALTON, D. V. S., HOUSE SURGEON.

I.—Lacerated Wound of Hip.—On February 14th, 1881, a horse was brought to the Columbia Veterinary Hospital suffering from a lacerated wound of the left hind limb, about four inches behind the patella. There was, however, more laceration of the subcutaneous tissue than the external wound would at first indicate. The wound was washed out with carbolic acid solution (1 to 40), and the edges brought together with sutures. The primary inflammation subsided under the influence of aconite and opium. For a few days the animal appeared to be doing well, the wound having closed by first adhesion. On the 17th, however, the leg in the immediate vicinity of the original wound began to swell. The swelling increased rapidly, the sutures were removed, and the wound was reopened. This was followed by a very copious discharge of very offensive pus. The animal had a severe chill, followed by profuse sweating, and the temperature rose to 104° F. Respirations, 20; pulse, 60. The patient seemed to be suffering excruciating pain, which was in part relieved by the free administration of opium. The following day the limb continued rapidly enlarging, although the wound was thoroughly cleansed with carbolic acid solution. The temperature rose to 106° F., respirations to 25, pulse to 70, with rapid loss of strength, the swelling rapidly spreading, and extending up to the abdomen. The animal died from septic poisoning the next morning.

This case is one of especial interest, as it shows how necessary it is, even in small wounds, to establish a free drainage, as many small wounds in the integument are accompanied by extensive laceration of the subcutaneous tissues.

II.—Lacerated Wound of Tongue—Amputation.—Dr. Walton was called to see the horse February 12th, 1881. The tongue was protruding from the mouth, greatly swollen, and quite cold and blue. During the night of the 10th the animal had run his tongue through a hole in the stall, and a neighboring horse had bitten it. It was also supposed to have been frozen subsequently. The tongue for the first two days was washed with a solution of zinc, and allowed to remain hanging out in the cold.

The horse entered the hospital on the 12th, in the above-described condition. The tongue, although cold to the touch, was thought worth trying to save. At this time the horse had lost all power to draw it into the mouth. The tongue was carefully cleansed with warm water. It was placed in a bag, and gently pushed into the mouth, and retained in position by tapes passing from the bag over the head back of the ears. It was hoped that by sustaining it in position the horse would regain the power to hold it within the mouth, and that the coldness and discoloration would be overcome by the warmth, and gangrene prevented. The mouth was washed with carbolic acid lotion, and a weak solution of liq. sodii chlorinatis; but on the second day it became more swollen, the discharge from the mouth grew very offensive, and gangrene seemed inevitable. The tongue was therefore removed on the fifth day after the receipt of the injury. A cord was drawn tightly around the organ, about two inches posterior to the discolored portion, and the tongue divided in the sound tissue with one sweep of the knife. Two hours after its removal the cord was removed. No marked hemorrhage occurred, though blood oozed from the stump for four hours after. There was no secondary hemorrhage, and the wound healed quite rapidly, so that the animal was ready to work in three days after the excision was performed. The only after treatment was a cleansing of the parts three times daily.

III.—REMOVAL OF FATTY FIBROMA, ANTISEPTICALLY.

REPORTED BY MARK L. FREY, D.V.S.

On the fifteenth of February a gray horse, sixteen hands high and weighing about sixteen hundred pounds, was brought to the hospital of the Columbia Veterinary College. The animal was quite lame, suffering from a fatty fibroma, involving the anterior spinatus, mastoid-humeralis and sterno-premaxillaris muscles, and interfering with deglutition. The fibroma had been increasing in size for the past nine months, and was probably caused by undue pressure of the collar. Blisters and setons had been applied, but without success.

The animal was secured and etherized, a long incision was made, and the tumor dissected out by Dr. Walton, the House Surgeon. It weighed four pounds. Carbolized spray was used; several arteries were ligated. The wound was brought together by quill sutures; and a compress, consisting of a moistened sponge, was placed over the part and held in position by a bandage passing over the shoulder.

Antiseptic treatment was kept up, stimulants used, and the animal made a splendid recovery, being discharged March 10th.

IV.—ACUTE CONGESTION OF THE LUMBAR REGION OF THE SPINAL CORD, CYSTITIS, PYELITIS, ACUTE PARENCHYMATOUS NEPHRITIS. POSTERIOR PARALYSIS OF THE HORSE.

REPORTED BY GEORGE H. PARKINSON, D.V.S.

A gelding, aged 10 years, had always been in good health prior to the present attack. This animal was used for light farm work, and only occasionally driven on the road, and then at a slow pace. The cause ol this attack is rather obscure, for the horse had not been exposed to wet or cold, nor does the attack seem to have supervened upon driving, although the first symptom of posterior weakness was noticed on the road. For several days before I attended the animal he was noticed to stumble, which difficulty increased, with a gradual loss of power in the posterior extremities. When I first saw the animal he was lying down, and was positively unable to get up. The pulse was beating from 45 to 46 per minute. Temperature, 102° F. Respiration quickened, with a spasmodic action of the diaphragm. The abdomen was distended with gas. There was almost complete loss of motion and sensation in the posterior extremities. The bladder was enormously distended with wind, rendering the passage of the hand into the rectum difficult and almost impossible. All the visible mucous membranes were injected. The appetite was poor, accompanied by great thirst. The skin was neither moist nor dry, but nearly normal. The animal was somewhat restless, and, from the constant rubbing of the head upon the floor, the eyes became very much inflamed, otherwise they appeared normal. There was no swelling or tenderness that could be detected in the lumbar region.

At first there was an increased quantity of urine, of a light amber color; but, as the case progressed, the quantity steadily became less, and the color of a deeper hue. All power to void the urine was lost, and the catether had to be used. On the second day after I first saw the animal the temperature fell, and remained nearly normal up to the day of death.

The treatment consisted in emptying the bladder with a catheter, cathartics, and balls containing digitalis and nux vomica. At the end of seven days the animal had not improved in any respect, and he was forthwith ordered to be killed.

At the necropsy I found the following conditions: The lesions were located principally in the genito-urinary tract and in the spinal cord, the other organs of the body appearing normal. The mucous membrane ol the bladder was congested, and showed evidence of acute and chronic inflammation, and at one point it was destroyed by an ulcerative process, leaving a raw surface the size of a half-dollar. The bladder was empty. The ureters and pelvis of the kidneys were deeply congested, and in the pelvis numerous ecclymotic spots were present. The pelvis of the kidneys also contained a little purulent fluid. The kidneys were hard and very deeply congested.

The microscopical examination of all the organs was made by Dr. Porter, at the School of Histology in connection with the Columbia Veterinary College, New York City, who found the kidneys to be in an advanced state of acute parenchymatous degeneration. The epithelium was finely granular and swollen, and in many of the tubules entirely wanting. Numerous blood corpuscles were present in each section; also pigment matter, probably blood pigment.

Spinal Cord.—There was no fluid in the subarachnoid space. The larger vessels of the meninges, covering the lumbar and sacral portion of the cord, were distended with blood, but there was not the slightest evidence of any inflammatory exudation. This congestion was also especially well marked on the spinal nerves at the point where they passed through the dura-mater, and probably produced considerable pressure on the nerves at this point. The cut surface of a tranverse section showed the blood-vessels as so many bright red spots and lines, the spots looking in some sections like infarctions. Microscopically, these bright red points, visible to the naked eye, proved in thin sections to be blood-vessels distended with blood corpuscles, and in some sections evidences of slight extravasation were present. The congestion was most marked in the anterior horns of the gray matter. Some of the vessels running from the surface of the cord to the gray nerve centres were distended throughout their whole course. The neuroglia interspaces were apparently distended, as if some oedema of the cord had existed during life.

MIDDLETOWN, CONN.

NOTES ON AUTOPSIES MADE AT COLUMBIA VETERINARY COLLEGE AND SCHOOL OF COMPARATIVE MEDICINE.

BY PROFESSOR E. C. WENDT.

V.—HEMORRHAGIC SPINAL MENINGITIS IN A MONKEY.—A small white-throated cebus (*Cebus hypolemus*) was sent to the anatomical department of the College by W. F. Conklin, Esq., Superintendent Central Park Menagerie. It was stated that the animal had been afflicted for the past six months with paralysis of the hind limbs. It was further added that this was a troublesome and rather frequent symptom in the monkeys at the Park.

At the autopsy, a fairly nourished body, without external marks of violence, was found. The organs of the chest were apparently quite healthy. The same was noted with reference to the abdominal organs. In opening the spinal canal, a striking picture of hemorrhagic meningitis was seen. The cervical and upper dorsal regions showed only a few scattered patches of hemorrhagic exudation, but, lower down, and especially at the dorso-lumbar region, the meninges were obscured by numerous irregular patches of a bloody fibrinous material. On removal of the dura-mater, which was adherent at many points, a few sanguineous patches were also found over the surface of the pia-mater. The substance of the cord itself was slightly congested, the hyperæmia being most evident in the gray substance. In the brain, or its meningeal coverings, inflammatory foci, or blood patches, were not found.

VI.—CONCRETIONS IN LARGE INTESTINE OF A SWAN.

At the post-mortem examination of a swan sent to the anatomical department from the Park, all the organs were apparently healthy except the large intestine. Here there was found a thick layer of hard crusts, with ragged edges. These solid masses were firmly united to the adjacent mucous membrane, and on forcible removal, portions of the layer were torn off from the intestine. The previous history of the swan was not communicated, nor did it appear that this abnormal intestinal condition bore any direct relation to the cause of death of the animal.

VII.—BLOODY INFILTRATION OF PELVIC CELLULAR TISSUE IN A DOE.

A doe which was sent from the Park was examined post-mortem, and found to have entirely normal organs, excepting its genital apparatus. It was ascertained that the pelvic cellular tissue, and especially that around the ligaments of the uterus, and around the vagina, was uniformly infiltrated with bloody fluid. The uterus was somewhat enlarged, and in its right horn a well-preserved product of conception was contained. The latter was about eight weeks of age, and showed no apparent deviation from a normally constituted fœtus. The brain of this animal was, however, not examined.

VIII.—EXTENSIVE CASEOUS DEPOSITS IN THE LUNGS OF A DRILL.

A medium-sized drill (*Cynocephalus papusi*) was sent to the dead-house, with a history of having suffered for some weeks from a severe coughing, and an apparent asthmatic affection. The dyspnœa appeared to be distressing, and the animal died seemingly exhausted.

At the autopsy both lungs were found to be extensively involved in process of caseous degeneration. On the right side the upper and middle lobes were the chief seats of the disease. The affected lobes showed no remnant of healthy pulmonary tissue, but were completely transformed into a moderately solid, cheesy substance. Several border crumbs were found in the otherwise uniformly caseous deposit. The pleura covering this collection of cheesy material seemed unaltered. The middle lobe bulged at one point to such an extent as to have pushed the heart far over to the left side.

On the left side the upper lobe was congested, but otherwise healthy. The middle and lower lobes, however, were just as extensively involved by caseous transformation as the diseased lobes of the right side. Throughout both lungs numerous cavities, of various sizes, were scattered, and these showed their lining membranes, and contained a softer, more purulent matter. The spleen was considerably enlarged, and it, too, was the seat of severe caseous nodules. In the liver a few deposits of this kind were also seen. The remaining organs were pale, but otherwise healthy.

According to the history furnished of this case, the whole process must be supposed to have been rather an acute one. In the human being, such extensive cheesy degenerations are often the result of chronic catarrhal pneumonia, or chronic tuberculosis. It would be interesting to learn, by more extended observations, whether this disorder forms a variety of caseous phthisis peculiar to monkeys in confinement, and running an invariably rapid course.

CORRESPONDENCE.

SINGULAR INSTANCE OF DEPRAVED APPETITE IN A MONKEY.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

ON the morning of March 22d one of the bonnet monkeys (*Macacus radiatus*) in the Society's collection was found prone on her stomach, in the bottom of the cage, in great pain. On making an examination, it was found that she was suffering from diarrhœa, and one-quarter grain of morphia was administered. By noon the pain seemed to be relieved, as she moved about the cage and took some food; but, as the discharges continued, a like dose of morphia was given. The next morning she ate as usual, nor could any signs of a discharge during the night be found. About noon she was siezed with violent convulsions, and died in about two hours. On dissecting her, the heart, lungs, and liver all appeared in a normal state, but the stomach and intestines were much swollen and inflamed. On opening the stomach, the enclosed mass of broom-straw tips was found, which, you will find, seem to have been swallowed without any attempt at chewing. She must have worked most industriously for a long while to pick up and swallow such a quantity of tips, which happened to break off the broom during the daily sweeping of the floor and dusting of the grating of the cage.

FRANK J. THOMPSON.

ZOOLOGICAL GARDEN, CINCINNATI.

[This curious specimen has been placed in the Museum of the Columbia Veterinary College.]

PREVENTING DISEASES BY INOCULATION.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

The recent report of the Department of Agriculture for 1880 on Contagious Diseases of Domestic Animals, especially with reference to pleuro pneumonia, the foot-and-mouth disease, and other kindred diseases, brings up the propriety of including in the researches concerning these contagious diseases the connection they bear to diseases in man. It would be well to investigate, for instance, if a preventive of scarlet fever is not to be found in the foot-and-mouth disease, and whether the purified virus of bovine tuberculosis cannot be applied, under certain conditions, to the human family, as in vaccination, as a preventive for phthisis pulmonalis. It is proven that diseases of domestic animals can be communicated to human beings, and, by vaccination of a purified virus, give protection for a specific disease.

If a preventive is discovered, that contains within itself a mild and effective means, that will give immunity, or lessen the severity of a disease that is contagious or not contagious, and applied as in vaccination, it is of immense importance to the human family. From practical experience in collecting and testing the animal or bovine virus from the calf for vaccination, as a preventive in small-pox, I find neither heat, cold, nor filtration changes the character of a virulent poison. But when cultivated in the systems of different animals, the virulence of the poison is taken away. It can then be used without any danger on healthy organisms, and will, in some diseases, certainly act as a preventive.

It is now well understood that the influence of one poison has the power of neutralizing or destroying the action of another. This is proven in vaccination for small-pox; and by the Negro, or Cholo, in Mexico, who inoculates himself with the poison of the rattlesnake, which renders him safe from the bite of all venomous animals. Trousseau perpetuated the records of the brave old pioneer of vaccination, Benjamin Jerty, who, long before Jenner, discovered the power of the cow-pox to produce immunity from small-pox, and applied the discovery to his own family.

The most difficult question that now confronts the medical and veterinary profession is that which relates to the prevention of disease. It is well said there is more of skill in preventing, or lessening, the severity of a disease, than in trying to cure it.

WESLEY MILLER, M.D.

NEW YORK, May 28th.

URÆMIC CONVULSIONS IN A PUG—AUTOPSY.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:—

The occurrence of convulsions in dogs that have been closely bred is, I believe, of quite frequent occurrence. As any especial study of the pathology of these convulsions is correspondingly rare, I send a report of the following case:

The dog in question was a full-blooded pug, eighteen months old. It had previously been very healthy, except for a slight amount of mange. Its mistress had treated this, without success, by warm soap-suds, which she applied every Sunday, to the neglect of her religious duties.

Its diet had been oatmeal and milk, with an occasional bone and "extras." Under this it had become fat.

On April 14th the dog was taken with a kind of delirium, running wildly about the yard. Convulsions soon set in, tonic and clonic in character. The pupils were widely dilated, and the animal frothed at the mouth. After a time he was unable to run about. Cold water was thrown upon him, *secundum artem,* by a frightened domestic, when the convulsions began; but this seeming to do no good, he was placed in hot water, with mustard, and a minim of Magendie's solution injected hypodermically. This produced no relief, and the dog soon died, respiration ceasing first.

AUTOPSY.—The brain was slightly congested, but showed no other change. Lungs somewhat congested; heart normal.

The abdominal viscera were normal, except the kidneys. These were very red and congested, the Malpighinan bodies showing plainly. Under the microscope, the evidences of an acute diffuse nephritis seemed to be quite well marked.

The nervous system of such dogs as the pug is finely organized, and easily thrown out of balance. It is probable that the morbid change in the kidneys threw sufficient poison into the blood to excite the convulsions.

C. L. D.

NEW YORK, June 9th.

A CURIOUS VETERINARY EXPERIENCE—BLOOD-LETTING IN THE WEST.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:—

I was recently called by telegram to visit a sick horse near Rockville, Park County, this State. On arriving at the place, and on my way to the owner's residence, I inquired of the man who took me in a buggy from the train, something about the horse's complaint.

"Well," said he, "the V. S. calls it the 'hooks,' and says that the horse turns his eyes unnaturally upward."

I remarked to the young man that I had no need to go farther, for that the doctor—as is usual out here—must have cut the haw or haws out of his eyes. "No," said he, "but he bled him."

"Scarified his eyelids, I suppose?"

"Not at all, sir; he bled him nine gallons from his neck."

Never supposing that any man would be guilty of such barbarous ignorance in this, the nineteenth century, I remarked that nine quarts was pretty heavy bleeding, especially for an inflammation of the haw.

Supposing, I presume, that I must be a novice in the art of bleeding, as practised in Park County, he remarked with emphasis: "Not nine quarts, but *thirty-six quarts*, and he returned next day and drew nine quarts more. That happened day before yesterday; and he came again this morning to bleed him again; but my brother, who is owner of the horse, told him that he had become skeptical about bleeding, and had telegraphed for Dr. Navin, of Indianapolis, who would arrive on the next train, and wished him to wait and consult over the case."

When I arrived I found the horse to be suffering from a slight attack of tetanus, and very weak from loss of blood. He was so nervous that I administered opiates through the rectum, which, with lobelia, was the treatment I ordered.

On the fourth day after this, I received a letter announcing that his jaws were relaxed, and his eyes much better. Some days later I received another letter, stating that he showed no further symptoms of the disease, but was still weak, and that his jaws were swelling. I ordered diffusible stimulants, diuretics, and a little sulphur, with warmth to the skin, together with the application of the tincture of iodine to the jaws, twice daily.

If you are as ignorant of the disease called out here the "hooks," as I was when I first came to this country, I must inform you that an inflammation of the haw, or any ailment that causes the horse to withdraw the eye from strong rays of light, constitutes a case of "hooks." The proprietor of a horse so affected sees that something is wrong, and very properly seeks the assistance of the best veterinary skill within reach. The usual result is as follows:

A veterinary surgeon is summoned, and joins a crowd of the neighbors, whose skill has been previously exhausted. Conscious of the superiority of his skill, he struts about a little and pronounces it a dangerous case of "hooks," and for the purpose of securing a five or ten dollar fee, proposes to bet a V that the haw is turning into bone, and that unless it is excised it will penetrate the eye, etc. The job secured, he casts the horse, and as these fellows are generally armed with a curved needle and thread, he runs the thread through the haw pretty deeply, and cuts both the membrane and the cartilage clean out, and with the impudence of Lucifer with all his host, presents the so-called bone, and reminds his patron of his pathological prophecy and skill. "Just as I told you, there is the bone!" Thus, he not only excites the admiration of the proprietor of the much-injured dumb animal, but also that of the entire crowd, and securing their future employment of his services.

The above is a specimen of Western Veterinary Surgery.

JOHN N. NAVIN, D. V. S.,
Veterinary Editor of Indiana Farmer.

INDIANAPOLIS, Ind., June 10, 1881.

THE PHYSIOLOGICAL ASPECTS OF BREEDING.

EDITOR OF THE JOURNAL OF COMPARATIVE MEDICINE:—

Both anatomical and physiological characteristics must determine the virtues of animals bred for special purposes. Growth and repair of the animal body are made at the expense of food consumed; and the capability of the animal to digest and assimilate largely in excess of the simple requirements for growth and repair, renders such animal profitable in the peculiar products for which it is bred.

It is therefore of no absolute importance that an animal bred for any special purpose is a small consumer of food, for an animal that will profitably convert the largest amount of raw material into any desired product, with the least possible wear and tear, and also with the least useless expenditure of material, is the best, no matter how great the consumption of raw material.

Though all excellence for all purposes cannot be secured in the same individual, yet, it is desirable to add lesser qualities to that which is the chiefest aim for a special purpose. Desirable form, sound health, good constitution, with capacious and active digestive apparatus, are all essential in breeding for profit. All of these characteristics are dependent upon physiological laws; and he who would breed successfully for special products, must learn that upon formed character and proper development will hinge all hope of success.

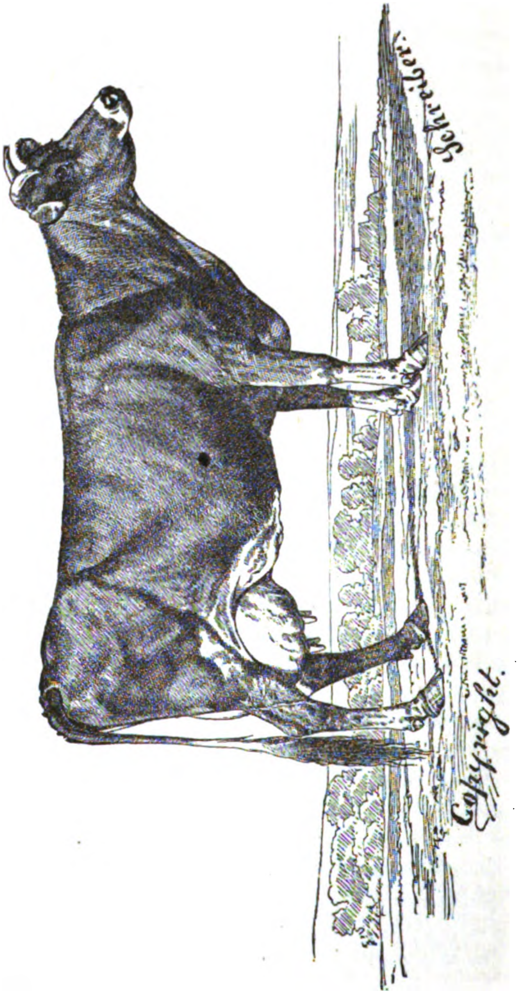
Professor Morly Miles aptly says: "The principle of correlation that enables the breeder to determine the internal characteristics and tendencies of the organization, through the indications presented by the external form, is of general application, and may be made use of in the study of animals representing the different breeds; but the point upon which an opinion is formed will necessarily have a different value in each breed, from the difference in the qualities that constitute perfection."

The form and proportions of an animal indicates internal structure, and to some extent the functional activity of the internal organs, so that form and function are specially correlated in animals.

To secure this special development of form, with a corresponding activity of function, constitutes the science of legitimate breeding. The study of the external anatomy peculiar to the different breeds, and the study of the physiological phenomena of digestion, assimilation, glandular metabolism, etc., common to all, are indispensable to him who would breed with success.

As we purpose to illustrate the subject of breeding in general for different objects, we shall be as brief as possible in treating of the special animals

which most profitably represent the different results of special breeding. The following illustration will convey the characteristics of external form and figure of the Jersey cow, "Favorite of the Elms" (1656), imported and owned by John T. Holly, of Plainfield, N. J.



To an expert, the form of this cow would indicate great excellence; but nothing but the positive test would show that in seven days this cow produced 16¼ pounds of butter of the finest quality.

This breed of cattle illustrates, very remarkably, to what perfection the art of breeding has been brought, as regards the production of a butter-

making animal. We see concentrated in it excellence for butter production far surpassing others of vastly greater bulk and weight. This is the result of long and persistent breeding for a special purpose; the steady application of physiological principles, the judicious union of the sexes of superior animals with a view to certain results.

In the Island of Jersey, which gave the name to this breed, so eminently suited to the butter-producing branch of the dairy, there are breeders of intelligence and judgment, who challenge even professional admiration in the means and in the results produced in perfecting the Jersey breed.

The development of the Jersey cow into so perfect a butter machine shows very clearly the means by which the stock of the country may be readily and certainly doubled in value. This is a subject of great interest to scientific and practical agriculture, and it foots up in a commercial point of view, thus attained, by millions of dollars. Such results can be accomplished only by studying the laws which govern animal life.

ALLEN S. HEATH, M.D.

PHAGEDÆNA.—A NEW DISEASE?

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

The term used for the disease I am about to describe is about as appropriate as any I have been able to find, and thus it is I use it. The disease to which I refer made its appearance amongst the horses in Cincinnati about the month of March last, and I find, from investigations, that it has also appeared in other Western cities to an alarming extent, and has in a considerable number of instances proved fatal.

It is a very remarkable affection, and at the same time singular, from the fact that it is entirely different to anything I have heretofore seen make its appearance, nor have I ever seen it described by any veterinary author.

When it first appeared in this city it was supposed to be an attack of what is commonly termed "cracked heel," and was in many instances treated as such, and successfully. But in some cases it assumed a malignant form; then simple remedies were entirely useless, and unless the most active measures were resorted to, the animal would certainly die from blood poisoning, as our experience soon taught us.

The manner in which it generally manifested itself, when of a malignant character, was by the animal's first displaying a slight lameness in one leg, which the owner, as a general thing, attributed to a slight sprain, or other injury to the leg, and in most instances the case was treated as such. But on the following day it assumed an entirely different feature. A small ulcer about the size of a pea would be observed between the fetlock joint and the heel, from which issued a thin, bloody discharge; but so slight is it at first, that but little attention would be paid to it, the owners in some instances supposing it to be a scratch from a nail, or some other foreign substance, with which the animal had come in contact accidentally. These little ulcers were generally washed off, and a poultice of some kind applied; but on the following day, on removing the poultice, it would be found that the sore had become considerably enlarged, and emitted an offensive odor. Still, there would not appear to be anything alarming in the case, until, in the next twenty-four hours, the ulcer displayed every evidence of gangrene, and the surrounding tissues commenced to slough away. If this stage of the disease was allowed to pass without receiving the most vigorous treatment, death from blood poisoning generally occurred on the following day. In two horses which I was called upon to treat, the disease began in the manner described, and both cases assumed the malignant form. Both became lame in front, and were confined to the stable in consequence; but on the following day a small ulcer appeared on the heel of each animal. Poultices of flaxseed were applied to each, but on the following morning the ulcers had considerably enlarged, had an offensive odor, and a large portion of the tissue had sloughed out, leaving a gaping, gangrenous, ugly sore. At this time I was called in, and after cleansing the wound thoroughly, and prescribing a carbolic solution as a dressing, left them until the following day. When I next visited the patients, which was on the following morning, I found the sloughing had extended about half way around the leg. In one case a piece of the integument, as large as a man's hand, was hanging loosely, exposing the ligaments and tendons; a dark-colored, bloody discharge was present, whilst the odor emitted was almost unbearable.

At this time the animals appeared to be very uneasy and feverish, lying down and getting up again frequently, appetite entirely suspended in both instances, respiration increased, and pulse quick and wiry. I was now fully convinced that the animals were suffering from blood poisoning, which had been absorbed from the gangrenous ulcer, and so informed the owner. I also gave it as my opinion that both animals would die, but determined to use such measures as the symptoms called for to relieve them. The bowels were much constipated, and the urine scant, so I administered a cathartic and diuretic, also large doses of bromide potas., fomented the leg with warm water, and dressed with carbolic solution. On the following morning the sloughing had extended all the way around the leg, the suspensory ligaments had given way, and the metacarpal bone was resting on the ground. The bowels had not responded to the cathartic, and in about an hour afterward one of the patients died, and in a few hours afterward the other one also; but in the latter case the disease had extended more to the inner structure of the foot, the hoof being ready to slough off.

The stench from the wounds was at this time fearfully bad, so much so, that I found it necessary to have the stable thoroughly cleaned and disinfected.

Three days afterward I was called on to see another case in the same stable, taken with precisely similar symptoms as the former patients. The ulcer had already commenced sloughing, and from it issued a discharge of the same character as in the other cases. I now came to the conclusion that I had an enemy to contend with, in which the ordinary treatment would not be of much avail, and that if it was not checked at once all treatment afterward would be useless. My first object was to open the bowels, and I gave a cathartic with that object in view. I then thoroughly cleansed the wound, and cut away all the loose parts; then saturated the wound with pure carbolic acid, and in about three minutes washed it again with warm water, and again dressed with the pure carbolic acid, covered the wound with cotton, and bandaged. I then had the leg, "as high up as the knee," sponged frequently with a solution of carbolic acid; in the evening again removed the bandage, and found the sloughing had extended for about two inches on one side. I again applied the pure acid, and bandaged as before. On the following day the bowels had responded, and on removing the bandage I found that the sloughing had ceased, the wound had a healthier appearance, and the odor emitted was less offensive. I then cleansed as before, and applied the same dressing. On the following day dressed with a mild solution, and from that time forward the healing process commenced; the animal made a fine recovery, and has been working ever since. Quite a number of animals in this city, suffering from the same disease, I am given to understand, have died. Since treating the two fatal cases, I have attended quite a number of animals affected in like manner, but, under the treatment described, have been successful in every instance.

I am of the opinion that the disease, in a great measure, originates from the extreme cold winter, aggravated by the admixture of salt and snow, the former of which has been freely scattered along the railroad track during the snowy weather, but which the laws of Ohio have not been able to prevent so far.

Efforts will, however, be made to prevent its being used on our streets during the coming winter.

G. W. Bowler, M.D., V.S.

Cincinnati, June 3d, 1881.

PROGRESS OF VETERINARY SCIENCE.

Vegetable Charcoal is highly recommended by English army veterinarians as a cheap and efficient dressing for wounds.

Gout in Parrots has been observed by M. Meguin, even when the birds were kept upon a vegetarian diet. This is a fact which is rather hard to explain upon the accepted theories of the pathology of gout.

A Case of Splenic Leucocythemia in a pig is reported by M. Henley, M. R. C. V. S., Veterinary Department, Ireland. The case was not diagnosed before death, and it is imperfectly reported in the *Veterinary Journal.*

Cases of Fibrinous Endocarditis in a Boar, and in a Cow, with resulting mitral obstruction, are reported by R. Roberts, M. R. C. V. S. The animals showed signs of distension of the venous system, with dyspnoea and weakness.

A Case of Rabies in the Horse was recently reported by J. C. Berne, of the Irish Veterinary Department, in the *Veterinary Journal.* The animal had been bitten in the lip by a rabid dog, two months before. The horse showed signs of the greatest nervousness and prostration, but there were few convulsions, and there was no aversion to water or inability to drink it.

Iodoform in Ozœna, Nasal Gleet, and Skin Diseases, is highly recommended by some English veterinarians. Mixed with two parts lycopodium, one of tannic acid, and blown upon the nasal mucous membrane, it acts very quickly and successfully. In painful ulcers it has an anodyne and antiseptic effect. In some of the skin diseases of dogs, given in doses of three and five grains, it is very useful.

The Red Blood Globules in the dog and horse and domestic animals generally, number 7,500,000 per cubic centimeter; those of man 5,000,000. In the domestic animals the proportion of white to red varies from 1 to 800, 900, 1,000 or 1,200. In the case of leucocythemia it is diminished to 1 to 85, 1 to 50, 1 to 15 or even 1 to 12; but it does not get to the proportions found in human leucocythemia, *i. e.*, 1 to 2, 2 to 3.

The Preservation of Anthrax Poison in Soils.—In connection with the note on animal poison on next page, it will be remembered that Pasteur advanced the theory that anthrax germs were always preserved in the soil for a long time. They might be brought to the surface earth by the earthworms, and thus made to affect animals grazing over the place. This asserion of Pasteur was denied by Mr. Colin. A Commission appointed by the French Academy of Medicine to investigate and decide the question, recently made a report in favor of Pasteur's theory.

A New Cestoid Parasite.—At a late meeting of the Paris Biological Society, Dr. Megnin exhibited a specimen of a new parasite, Triscuspidaria nodulosa, which presents many marked differences from the ordinary tænia, having claws in place of suckers on the abdomen, and pursuing all its generations in the same animal. The parasite is found in the perch, trout, sun-fish and some other fish, and it is not impossible it may be at times found in man.—*Chicago Medical Review.*

Trichinæ in Chickens.—Cobbold and others have fed trichinous flesh to poultry, and afterwards examined the flesh for trichinæ, but in no case were any found. This is a singular circumstance, for which we believe no satisfactory reason has thus far been adduced. At first sight, one might suppose that the peculiar mode of digestion which obtains in the case of birds might be the cause, but this is evidently not the true explanation, since living trichinæ are found abundantly in the lower part of the digestive tract after the fowl has been fed with trichinous flesh. Thus far, however, we believe that no trichinæ have ever been found encysted in the flesh of the ordinary breeds of poultry.—*American Journal Micros.*

A Canine Epileptic Affection Caused by Acari.—Meguin recently communicated to the Societé de Biologie, the existence of an epileptiform affection, apparently contagious, which decimated for several years the kennel of a rich dog fancier near Havre. On careful examination, it was found that the disease was due to the presence of an acarus in the auditory canal of the dog. This acarus, already known under the name of *Chonoptes Ecaudatus*, has been found in the dog, cat, and ferret, but only in the cat has it been recognized as the origin of a vertiginous affection. Injection of an aqueous, one in five, solution of sulphate of potash cured the disease. —*Chicago Medical Review.*

The Persistent Effect of Animal Poisons.—That germs of disease may live long, seems to be proved by recent experiments of a French Committee directed by M. Pasteur. Seven sheep were led daily, for a few hours, to a piece of ground where some animals that died of anthracoid disease, or *charbon*, had been buried *twelve years previously*. Two of them caught the disease and died. There was no grass for the sheep to eat, and it is thought those two must have received the germs in the course of smelling about the ground, as sheep generally do. It may be added that on some ground of that farm, where diseased animals had been buried, vegetables are now grown; and M. Pasteur asked the farmer if any employes, etc., about the farm had been affected. He knew of none, but showed a healed sore of malignant pustule (the same kind of disease) on his own face. M. Pasteur supposed that if the vegetables eaten had not been cooked, there might have been a different tale. The disease, too, might be communicated by the agency of insects, etc.

The Effect of Lightning upon Animals.—Lightning, according to Mr. G. A. Banham (*Veterinary Journal*), strikes the lower animals more powerfully and oftener than it does man. Some examples of this are given. During a thunder-storm in France, 78 sheep and 2 dogs, watching them, were killed at one flash, the woman in charge being only slightly affected.

A man was stunned by lightning which killed a cat beside him.

Many instances are given in which horses, mules or oxen have been killed, while the driver was but little injured.

Another fact is, that when animals are herded together, or are standing in a line, those at the outside are injured most.

White-haired animals seem to be oftener struck.

As to the lesions of a lightning stroke, it is calculated that only in about one-sixth of the cases are any anatomical changes to be found. These changes are generally in the nature of burns, rupture of muscles, or external marks of some kind, perforations, fractures, etc. Rigor mortis is usually well marked.

The metal shoes of the animals may be magnetized.

Death is produced usually by shock. If death does not occur at once, the animal usually recovers rapidly.

It is an important fact, from a medico-legal point, to remember that an animal may be killed by lightning and show no trace of the cause of death.

The Ration of Ensilage for a Cow.—Some experiments made at the New Jersey Agricultural Experiment Station have thrown much light upon the value of ensilage. Concerning the ration for a cow of 1400 lbs. weight the following is stated: If she is a good milker and the ensilage is green corn, she will require 90 lbs. daily of corn ensilage, or 16,380 lbs. in six months; and besides this, say 8½ lbs. of corn meal and 8 pounds of bran mixed per day. Let us put this in the formula of a ration:

RATION FOR A 1400 LB. COW IN MILK.

	Dry substance, lbs.	*Albuminoids, lbs.*	*Carbo-hydrates, lbs.*	*Fat, lbs.*
90 lbs. of ensilage	17.37	1.08	9.00	0.41
8½ lbs. of corn meal	7.40	0.64	5.72	0.26
8 lbs. of bran	7.09	0.80	3.88	0.25
	31.86	2.52	18.60	0.92

Nutritive ratio 1:8.3.

This gives food enough, but the proportion of albuminoids is too small. If we substitute 2½ lbs. of linseed meal for that amount of corn meal, the amount of albuminoids will be over 3 lbs. per day, and will do very well.

Trance in the Lower Animals.—In connection with Dr. Beard's notable article on this subject in our last issue, we publish the following account by Mr. Carl Orchsemius in *Nature:*

He says: In the interior of the province of Valdivia, South Chili, a species of wood snipe is often caught by the natives in the following manner: When the bird flies into one of the low bushes, two men on horseback go around it in the same direction, swinging meanwhile their lazos over the bush. After ten or more rounds one man slips down from his horse, while the other continues to ride round the undergrowth leading his companion's horse. The dismounted rider carefully creeps on to the place where the snipe sits in a state of stupor and nearly motionless from the effect of the rider's circular movements, and kills it with a quick blow of a stick. When the writer was first told of this mode of capturing a bird, he would not believe it, but he himself, in 1853 or 1854, took part in this very sort of method of taking the bird in the hacienda San Juan, in Valdivia. He left the house without a gun. He saw a snipe fall into a dense bush, and expressed his regret to a servant that he had not a gun, so that he might secure a good specimen of a not very common species for the natural history collection. "Never mind," said the servant, "if you wish, we will get the bird;" and the bird was caught, without injuring it, substantially in the way above described.

DISEASES OF ANIMALS IN CAPTIVITY.—The following interesting list of the causes of death of animals in the Phialdelphia Zoological Gardens is sent us by Mr. Arthur Erwin Browne, the Superintendent:

	NAME OF ANIMAL.	CAUSE OF DEATH.
1.	*Siren lacertina*	No organic disease.
2.	Moor Monkey (*Mac. maur.*)	Phthisis.
3.	Howling Monkey (*Mycetes pall.*)	Heart disease.
4.	" " " "	Inflammation of intestines.
5.	Ant Eater (*Myrmecop. jub.*)	No organic disease.
6.	Howling Monkey (*Myc. pall.*)	Phthisis.
7.	Cassowary (*Casuar. gal.*)	Dysentery.
8.	Porcupine (*Hystria crist.*)	No organic disease.
9.	Phalanger (*Phalan. mep.*)	Peritonitis.
10.	Porcupine (*Hystria crist.*)	Heart disease.
11.	Sea Lion (*Zal. gillesp.*)	Tuberculosis.
12.	Phalanger (*Phal. mep.*)	Paralysis.
13.	Kangaroo (*Petrogale pencil.*)	Hydatids of liver.
14.	" " "	No organic disease.
15.	*Menobranchus lat.* "	Taenia and Peritonitis.

FARCY.—Farcy is a strictly contagious disease, but it is not so easily communicated from the diseased to the healthy animal as glanders is. Among the means by which farcy is most readily communicated may be mentioned the use of the same harness, blanket, brush and curry-comb, on other horses.

It may develop spontaneously; that is, as a result of faulty ventilation, excessive labor, together with insufficient and unsound food; in fact, from any cause that tends to reduce the vitality of the system. It is frequently a sequel to chronic diseases of various kinds, both internal and external.

In appearance it bears no resemblance to glanders, though it bears a certain relation to it; in fact, farcy and glanders may be regarded as twin diseases.

Either of the two diseases generally terminates both forms fully developed.

The treatment of farcy is not often successful, and requires considerable patience and judgment, which the amateur cannot be expected to possess. We have always hesitated in recommending any treatment of farcy, because the remedies from which the greatest measure of success is likely to be obtained, such as a combination of strychnine with arsenic, phosphorus, etc., are too heroic in their effect, and too dangerous to be trusted in the hands of novices. The physiological effects of such remedies must be closely watched to prevent fatal accidents. The necessity of gradually increasing the doses, and of diminishing or entirely withholding them, is another consideration. Again, the long continued use of any remedy has a tendency to lessen its effect, from the system becoming, as it were, habituated to them. This renders the alternate use of such remedies a necessity. Treatment of farcy can only be recommended in the beginning of the disease, and, with that understanding, the following remedies may be used: To the farcy ulcers apply either a strong solution of chloride of lime, carbolic acid, or lunar caustic; or touch with hot pointed iron. Internally give, twice daily, half a drachm of iodide of copper, or iodide of iron, with half an ounce of gentian root. An ounce of aloes, with half an ounce of saltpetre, may be given every fortnight. Keep salt constantly placed within the reach of the horse. Give good nourishing food, in liberal quantity, daily exercise, or liberty on pasture, and attend to general cleanliness. Thorough disinfection of premises and utensils is necessary.—*Dr. Paaren, N. L. A. Jour.*

DROPSY IN HORSES.—From the *National Live Stock Journal* we learn that dropsy in horses is unusually prevalent the past season, excited by the sudden and extreme changes in the temperature.

Plethoric animals, and those in an anæmic condition, seem to be the chief sufferers. For this diseased condition preventive measures are recommended. In the stable, attention to cleanliness, dryness, good ventilation and sunshine—to all those things which tend to maintain sound and vigorous health. Exposure to severe storms or sudden changes in temperature are to be avoided, as far as possible, and mitigated by suitable clothing; especially are they to be avoided during the spring and autumn, when changes in the coat are occurring. "All disorders of the air-passages calculated to impair the condition of the blood, and all debilitating diseases, should be attended to at the outset, especially in damp, cold, and exposed localities, where the tendency to these dropsies is the most marked." "For the treatment of those diseases which affect the air-passages all depleting measures are to be avoided." "The patient to have warm, dry, comfortable buildings, with the purest air, sunshine, and soft, nourishing, and easily digested food." "If there is any tendency to coldness of the surface and limbs, the body should be warmly clothed, and the limbs loosely bandaged, to avoid those chills and nervous derangements which are so likely to cause dropsical complications." For the treatment of the dropsy the following is recommended: First, an aloetic purge, followed by a daily dose of nitrate potassa, half ounce; iodide potassa, one drachm; chlorate potassa, half ounce; nux vomica, ten grains; and gentian, two drachms.

The swellings to be rubbed with a liniment composed of turpentine, one ounce; sulphate zinc, half ounce; olive oil, one pint; and if upon the belly or legs, scarifying is admissible, but to be avoided if upon the nose, where sloughing is likely to occur. If the patient is anæmic, the purge must be dispensed with, and stimulants and tonics administered, with good nursing.

RUPTURE OF THE HORSE'S STOMACH.—Rupture of the stomach is more common in the horse and ox than in all other animals. It is produced in various ways. Cattle have a certain carelessness regarding the ingredients of their diet, and frequently swallow with food all sorts of foreign bodies, such as nails, forks, knives, pieces of iron and bone, &c. These occasionally lacerate the stomach. Cattle and horses turned into new clover, or luxuriant pastures—after having been kept on dry food—very frequently die from rupture of the stomach as a consequence. They eat ravenously until their stomachs are over-distended; the material is rich and succulent, and not properly masticated, and ere the gastric fluids can act upon the crude mass and bring about digestion, fermentation takes place; carbonic acid gas is largely eliminated, which inflates the stomach, and if produced in sufficient quantities, the stomach is literally blown to pieces. Horses fed on Indian corn, cut feed, or after a change of diet, are especially liable to indigestion, fermentation and rupture of the stomach. Horses with tympanitis (bloat colic) often rupture themselves in falling during the paroxysms of pain. I have frequently known horses to be well at noon after the morning's work, eat their dinner, and tympanitic colic kill them in three hours, either by mechanical pressure or rupture. Another cause in the horse is one which would not be so apt to arise in other animals—the horse's stomach is small in proportion to his size. Now, if he is over-fed or gets loose and gorges, and then gets to water, or is allowed to drink, the swelling of the food may produce rupture. Any slip or exertion has a like result.

The symptoms are uneasiness, pain, stretching out the forelegs, arching the back, walking round and round, endeavoring to get the fore-legs higher than the hind-legs (as to stand-point), and sitting up on the haunches like a dog; agony is written on the anxious countenance; cold sweats and tremors of the limbs and muscles are perceptible. Vomiting is a symptom of rupture in the horse, and dark fluids issue from the nostrils on some occasions. The pulse is quick, weak, and soon becomes imperceptible.—Dr. E. MOORE in *Country Gentleman.*

LAWS RELATING TO CONTAGIOUS DISEASES OF ANIMALS IN GERMANY.—An elaborate series of provisions has recently been made in Germany for preventing the spread or importation of contagious diseases among animals. The part relating to the suppression of the disease is as follows:—

The owner of domestic animals is obliged to make immediately to the police authority the declaration of the appearance amongst his stock, of one of the epizootic diseases, as well as of the suspicious signs making him fear the existence of such disease, and to keep the animal away from the places where there is danger of other animals being contaminated.

These same obligations exist for the agent of said owner, and also in relation to the animals in transportation to those who have them in charge, and in relation to animals given in keep to other parties, to the owner of respective farms, stables, pastures, &c.

Are also obliged to make the same declaration the veterinary surgeons and all persons which professionally exercise veterinary medicine; as well as the inspectors of slaughter houses, as well as those whose profession is to remove, sell or work on animal cadavers or substances when, before the police have taken measures, they have knowledge of the eruption amongst animals of one of the following epizootic diseases or the apparition of suspicious signs.

The epizootic diseases to which the obligatory declaration is applied are:

1st. Anthrax.

2d. Hydrophobia.

3d. Glanders and farcy of horses, donkeys, mules.

4th. Foot-and-mouth dieases of bovine, sheep, goats and swine.

5th. Pleuro-pneumonia of bovine.

6th. Small-pox in sheep.

7th. Maladie of coit (dourine) of horses and the coital exanthems of horses and bovines.

8th Scabies of horses, donkeys, mules and sheep.

The Chancellor of the Empire is authorized to make also for other epizootic diseases the declarations transitorily obligatory.

For the districts where anthrax exists permanently, the governments of the different States of the Confederation are authorized to take it off the obligatory declaration as long as the disease appears only on isolated cases.

ROUND WORMS IN THE ALIMENTARY TRACT OF SHEEP.—Three varieties are mentioned, and declared equally as dangerous as the tape-worm.

First, the *Strongylus contortus*, a white cylindrical worm, from one to two inches long, tapering equally at both ends, which inhabits principally the fourth stomach.

Second, the *Strongylus filicollis*, from one to two inches long, but furnished with a long tapering neck and round mouth, which inhabits the small intestines.

Third, the *Trichocephalus offinis*, or *whip-worm*, a round worm, but smaller than the two preceding. This variety is only six or eight lines long, the anterior part of the body attenuated to a fine hair, and inhabits the blind gut and colon. The three varieties are found clinging to the mucous membrane in great numbers if the animals are opened soon after death. Later they become detached, and are often overlooked. They produce death both by sucking the blood from the animal, and keeping up a constant irritation. The *Strongylus filicollis* is said to be the most destructive of the three, for two reasons: First, the location, and, second, the formation of the mouth, enabling them to produce more irritation. The *Trichocephalus affinis* is often found with one end deeply imbedded in the mucous membrane, but it is the least irritating, probably because the colon is the least sensitive part of the alimentary tract. In small numbers, all three varieties are harmless, but when present in large numbers they are very destructive, and especially to the young of a flock.

The same general symptoms are present in all the varieties—loss of condition, spirits and vigor, tenuity and lifelessness of the skin, pot-belly and razor-back, irregular appetite and fœtid diarrhœa. The diarrhœa is the marked symptom, and often, by carefully examining the fæces, some of the worms can be found.

These parasites differ from the tape-worm in not passing through a series of changes in different animals, but develop upon the receipt of the egg into the alimentary tract of the sheep. The embryo worm is as tenacious of life as the Tænia, maintaining its vitality in water, moist earth, on green vegetables, but only rapidly developing when introduced into the sheep. One male and female are all that is needed to produce millions.

Owing to this great tenacity of life, land may become infested with the eggs, and successive flocks destroyed. Fodder cut from infected land can be fed with impunity to horses and hogs, but is dangerous to the sheep.

The succulent and juicy crops harbor the most prolific eggs. The eggs also appear most prolific when the dew is on the grass, and in the springtime, when the sheep tear up roots and all. If infected pastures must be used, dry days only should be chosen.

Surface drainage may be the cause of a well becoming impregnated, and in that way whole flocks be attacked. Streams running through infected pastures may be a cause of spreading the parasites.

A high-priced ram may come into a flock with a few in his system, but not enough to affect his condition; but by breeding and multiplying, they enter the weaker and more poorly fed, and young—constantly increasing in a geometrical ratio, until the hoped-for improvement of the flock by a new ram has resulted in the opposite—death of large numbers, with infected pastures.

At first the older sheep seem to suffer comparatively little, while the lambs melt away like snow, until a whole flock may be destroyed, and the lambs often become infected before the real danger is fully recognized and appreciated.

To rid the sheep of the parasite, ten grains of tartar emetic and ten grains of carbolic acid are recommended; also, oil of turpentine, one-half ounce; castor oil, four ounces, twice a week, salt to like, and bitter tonics.

Treatment should be conducted in yards which can be cultivated, and not used for pasturage until the disease has been arrested and completely exterminated. When the malady is arrested the animals should be turned into non-infected pastures. Infected land should always be cultivated for a long term of years.—*National Live Stock Journal*, March, 1881.

NEWS AND MISCELLANY.

Pleuro-Pneumonia has been stamped out of Pennsylvania.

A New Veterinary School.—It is proposed to start a new veterinary college at Aberdeen, Scotland.

Flaxseed Meal is recommended now for stock as superior to oil meal, because it can be gotten purer, and is quite as nutritious.

The Alumni of Columbia Veterinary College have organized into an association. It seems likely to become a very useful society.

A Cross-eyed Mule.—Dr. A. A. Holcombe, in the *Veterinary Review*, reports a case of a mule with double internal permanent strabismus. Quite a rare affliction.

Another Fertile Mule.—An army mule in Texas, not long ago, became pregnant from a mustang, and gave birth to a colt. The colt did not live, however.

New Veterinary Publication.—Mr. W. R. Jenkins is to republish in this city Gamgee's Veterinarian's Vade-Mecum, a work which has been quite popular in England.

Steel on Diseases of the Ox.—We have just received from John Wiley & Son, publishers, of this city, Steel's valuable work on the Ox. A full notice of it will be given in our next issue.

At the Veterinary Hospital at Leipsic, under charge of Dr. Zürn, inflammation of the legs is treated by putting the leg in a kind of long, thin rubber bag, which is kept filled with cold water.

Bi-chromate of Potassa.—Mr. Coultard praises this for femoro-tibial synovitis in cattle. It is recommended, first, to subdue active inflammation by cold; then apply the potassa, mixed with lard, in proportion of 4 to 30.

A New Cause for Pleuro-pneumonia.—Dr. Rose, V. S., of Richmond County, Staten Island, claims to have discovered in the lungs of a cow that died of pleuro-pneumonia a parasite, which he believes is the cause of the disease.

The Fluke Parasite is now found to have been widely spread in England by the inundations which were so prevalent and extensive in the late summer and autumn months of 1880, and flockmasters are once again in trouble.

AN EXPORTATION OF FOOT-AND-MOUTH DISEASE.—Nearly all the cattle by the Allan Line steamer "Phenician," which arrived at Glasgow May 31, from Boston, were found to be affected with foot-and-mouth disease. The slaughtered carcasses were boiled down.

ANTHRAX IN THE WEST.—Anthrax has been extensively prevailing among the cattle of the West, especially in Nebraska and Iowa. The Wyoming Cattle Association has commissioned Dr. Foote to investigate this disease, and also to inquire into pleuro-pneumonia.

THE HORSES OF NEW YORK.—It is estimated that there are 50,000 horses in New York city. An exact census of them has never been taken. The average value of a horse is $200, and the stock, therefore, represents $10,000,000. The death rate among them is very high.

EQUINA, OR HORSE-POX, VERSUS PHAGEDÆNA.—The disease which is described by Dr. Bowler as phagedæna is asserted by Dr. J. I. Tucker to be genuine "grease," or horse-pox. The facts given by Dr. Bowler seem to contradict this view, but the question cannot yet be decided.

A HORSE IN SPECTACLES.—Lord Denman, a friend of the domestic quadruped creation, drives a horse that wears spectacles about the streets of London. The animal was found to be near-sighted, and its owner has successfully tried the experiment of remedying the defect in the same way as is done with human beings.

CONTAGIOUS PLEURO-PNEUMONIA IN ENGLAND still prevails, in spite of stringent measures to stamp it out. It is asserted that a great deal of the disease comes from infected cows in Ireland; and Ireland, instead of America, is now the country against which restrictive laws regarding importation are urged.

VETERINARY CONGRESSES.—A Veterinary Congress of the veterinarians of Belgium was held not long ago at Brussels, and was a very successful affair.

The British Veterinary Congress mentioned in our last issue will probably be held on July 13th and 14th, at London.

THE TREATMENT FOR DYSENTERY IN DOGS, at the Alfort Veterinary School, consists in giving subnitrate of bismuth and laudanum; and keeping the animal on two quarts of milk, sufficient water, and a drachm of bicarbonate of soda per day. This gives excellent results in the dysenteries that so often complicate sickness in young dogs.

DEATHS.—The oldest teacher of veterinary medicine, Dr. E. Hering, late Director of the Stuttgard Veterinary School, died recently at the age of 82 years, from an attack of cerebral congestion, which carried him off in four days. He is best known by his Manual of Operative Veterinary Surgery.

Prof. Corbyn, one of the oldest veterinary practitioners of Philadelphia, died lately at the age of 72.

THE VETERINARY SURGEON'S BILL, introduced last winter into the English Parliament, aims to compel all practicing veterinarians to become registered. It has been made a government measure, and will, undoubtedly, become a law. This will greatly raise the status of the English veterinarian. And he will probably be more disdainful of his American brother than ever.

But plumbers and druggists are registered in this country, "and why not every man?"

A Veterinary Law in Illinois has at last been enacted. It provides for the appointment of a State Veterinarian, who is empowered to keep watch upon and quarantine all cases of infectious disease among cattle. It compels persons also to notify the State Veterinarian of any case of pleuro-pneumonia among cattle upon his premises. The law is somewhat like that in New York State, but it seems to be a more complete one in some respects. Only $8,000, however, are appropriated for carrying it out.

American Pork.—A writer in the *Journal de Pharmacie et de Chimie* has found the following parasites in American pork, viz.: Tricocephalus dispar, Stephanurus dentatus, Echinorhyncus gigas, Cisticercus cellulosa, Fasciola hepatica, and Distomum lanceolatum. He also asserts that Trichina spiralis is not uncommon in American hams.

The gentleman who found all these things in American hams ought to settle in Chicago. He would get such a welcome!

Cribbing is a habit of vice which is acquired, usually in young animals when teething, or in horses of maturer age that are either too little used or too highly fed. It may arise from a morbid feeling induced by indigestion, or be learned by companionship. When the habit is acquired, there seems to be a fascination about it that defies the art of man to cure. We prevent it from day to day by neck-straps or muzzles, or patent halters or zinc hearts attached to five-ringed halters, or by pasting obnoxious materials or drugs upon the mangers, &c. But the desire, the habit, we fail to eradicate.

The Destruction of Lice.—Wm. Home, V.S., in the *Country Gentleman*, recommends the following as safe, and very effectual for the destruction of lice on cattle, horses and dogs.

Arsenious acid, two drachms.
Aqua, one pint.
M.

With a small sponge, the parts infested are to be well rubbed over with this mixture. The preparation to be constantly agitated, to prevent the arsenic settling to the bottom of the dish.

Treatment for Diarrhœa in Calves.—In the treatment of this, as of other forms of diarrhœa, the first step is to clear away the irritant from the bowels by a dose of 2 oz. castor oil and a teaspoonful of laudanum. It may be beneficial to add 5 drops of carbolic acid. When this has operated the patient may take, thrice a day 5 grains of the following mixture: Calomel 1 drachm, chalk 1½ oz. He may further take, three or four times daily, 2 teaspoonfuls tincture of ginger, 20 grains gum arabic, 2 drachms chalk, and 5 drops carbolic acid. A sixth of a rennet may be steeped in a quart of wine, and a tablespoonful given with every meal.

A Monstrosity in Fowls.—A full-grown chicken which was brought to the market of Shelbyville, Tenn., was found to possess three legs. A *post-mortem* examination, made by Dr. Fite, revealed the fact that the internal economy was even more queer than the extra leg. The crop, heart and lungs were natural, but the intestine, about midway of its length, subdivided into four distinct canals; these finally became reunited into one, and this, just before emerging from the body, divided into two distinct vents. The chicken was found also to have two distinct livers, one on each side. The monstrosity was a fat and healthy looking subject.

Museums for Private Veterinary Practitioners.—The establishment of small or large museums by private veterinary practitioners is a very useful suggestion that has recently been made by Dr. J. H. Steele, in the *Veterinary Journal.* Such a thing is very practicable, and should be attempted especially by the younger part of the profession. These museums should include anatomical specimens of all kinds, special devices for surgical treatment, models, dried preparations, charts, chemicals, etc. They might be made to illustrate any specialty which the veterinarian was engaged in. They would serve to educate pupils, illustrate cases, exhibit the methods of the practitioner, and would assist him in numerous ways.

Sows Eating Pigs.—A writer in the *Country Gentleman* gives the following as a preventive of the destructive habit:—When I have an old sow (they are the worst) ready to drop her pigs, I go to the smoke-house, get an old piece of refuse meat—an old piece with bone is the best, as they like to gnaw at a bone—I take this and give to the sow. Her appetite seems to crave something of the kind, and it is sometimes surprising to see how greedily she will devour the meat. I have seen sows leave corn, slops and pigs for the old salty meat. My father tried this several years ago, when other things had failed, and one piece of meat, say four or five pounds, seemed to satisfy her appetite, and she raised the pigs without any more disposition to eat them.

An Epidemic among Deer, resulting already in the death of more than one hundred valuable animals, has broken out among the deer herds in the Duke of Portland's park in Nottinghamshire, England. More deer are dying daily, and at present no means have been found to stop the spread of the infection. A *post-mortem* examination of one of the bodies has resulted in finding a small, thread-like worm infesting the bronchial tubes of the lungs and small intestines, the irritation of which caused congestion and inflammation of both organs, the symptoms being aggravated by the late prolonged wet and severe weather. The parasites are white, no thicker than a hair, and an inch long. It is reported that a similar disease has broken out in other English deer parks.

The Bill to Prevent the Spread of Contagious Diseases Among Animals passed the New York Legislature, but excited the following criticisms:

Mr. Jacobs opposed the passage of this bill, and read from the report of the Cattle Commissioners to show that the money appropriated for a similar purpose last year was squandered in many cases. He said healthy cows were killed and paid for at the rate of $15 per head, and their carcasses exposed for sale in market the next day. As a sample of extravagance, he cited one case where it cost the State $300 to kill one cow. Reckless expenditures were also shown in traveling expenses, hotel fare, carriage hire, &c., and he argued that no more money ought to be intrusted to the charge of the same officers who squandered last year's appropriation. The bill appropriates $50,000.

A Dog Home and Hospital.—There are several of these institutions in this city. An account of one of the largest, on Green street, was given in the *Tribune* not long ago. The "Home" contains about 300 dogs, only a small part being in the hospital wards. The keeper of the house and his wife have been in the business for thirty-five years. The wife is herself a dog doctress, and gets $3 for each of her visits. The proprietor says:

"People, somehow or other, will go to any sacrifice to save a pet dog, while they seldom scruple to kill a good horse that has broken its leg or become otherwise injured."

"Ay, it's a dire shame that so many fine horses should be slaughtered who only require a good surgeon to cure them completely. I have set horses' as well as dogs' limbs in such a manner that no expert would have been able to tell the difference."

According to reports, dog-doctoring in New York is a profitable business. It is a misfortune that it is so entirely in the hands of ignorant persons.

An Epidemic among the Horses at Chicago and Elsewhere.—A very malignant form of disease has prevailed among the horses of Chicago, and a large percentage, varying from 20 to 70 of the number, were at the time, in consequence, unfitted for work, and were kept in the barn for treatment. It first appears in the feet, just above the hoof, and develops very rapidly. A horse may go into the barn or stable at night with scarcely anything apparently ailing him, and be found the next morning unable to move from the stall. The first indication is a swelling, followed by a suppuration, which breaks out, producing a kind of running sore. As the disease grows the legs become swollen, and sometimes it spreads to the body, and when this occurs it is likely to result fatally. The cause is attributed to two sources. Some claim that the salt sprinkled on the car-track during the past winter is responsible for the disease. The other cause is said to be the long season of snow, ice, and frost, with frequent intervals of rain or moisture, in which the feet have stood while on the street or at work.

Later reports show that the disease has extended to Cleveland, O., Cincinnati, Milwaukee, Wis., and other places.

A full account of it is given by Dr. Bowler on page 199 of the Journal.

The Healthfulness of American Swine.—In view of the action taken by the French and other European governments in regard to American pork, as well as to be able to correct by positive and personal evidence the exaggerated reports which are published in Europe concerning hog cholera and trichinæ among American swine, Secretary Blaine sent the Chief of the Bureau of Statistics of the Department of State to Chicago and Cincinnati to investigate the entire question of hog-raising and pork-packing in the West in all its phases, "from the farm to the ship." In accordance with the Secretary's instructions, this gentleman visited representative hog-raisers, buyers, shippers, packing houses, stock yards, rendering establishments, health offices, and forwarding agents.

His report, which was submitted in May, was to the effect that American swine are the purest in breed and most healthy of any animals of the kind.

The report is received with some incredulity abroad, partly because it is, after all, only quasi-official, and represents but one man's investigations and opinion, and he a non-expert. Still, there is a much better feeling in Europe now regarding American pork.

Inversion of the Vagina of a Cow.—A case of this kind is related in the *Country Gentleman* as follows:

"My cow is three years old and is farrow. A few weeks ago I noticed something protruding from the vulva, looking hard, fleshy, and very red. This occurred when lying down. She seems to eat well, and gives a good quantity of milk. When standing, there is nothing to be seen, except there seems to be considerable inflammation outside."

The treatment advised by Dr. Moore is, to foment the protruded part with 4 qts. of warm water, and alum 6 oz., then return it with the hand easily. Put a single harness saddle on her and buckle one of the driving reins in the terret of the left side, then take the rein down that side under the belly and between udder and left hind leg, up the left side of tail and over back, tying in the right terret. Do the same with the other rein, which, of course, follows the right side and ends at the left terret. Thus the two cross over the spine. Then tie two strings connecting the reins, one near the top, the other near the bottom of the vulva. This will act as a truss. Give her the following drench: Sulphate of soda, 1½ lb.; powdered saltpetre, 2 oz.; powdered ginger, 1 oz.; powdered capsicum, ½ dr., mix, dissolve in hot water and give at one dose. Inject, with a rubber syringe, three times daily, the following into the vagina: Tincture of opium, 1 oz.; elixir pro., 2 oz.; powdered alum, 2 oz.; water, 1 qt.; mix.

ELEPHANT DENTISTRY AT THE ZOO.—One of the Indian elephants some time since had the misfortune to wrench off a portion of its trunk which had got caught in a noose of rope, and the largest African specimen, whose huge proportions are well known to the frequenters of the Gardens, met with an accident by which its tusks were broken off; the stumps subsequently grew into the cheeks, causing it excruciating pain, and necessitating an immediate remedy. The intrepid Superintendent undertook to perform the delicate operation and relieve the poor beast. Having prepared a gigantic hook-shaped lancet, he bandaged the creature's eyes and proceeded to his task. It was an anxious moment, for there was absolutely nothing to prevent the animal killing his medical attendants upon the spot, and to rely upon the common sense and good nature of a creature weighing many tons and suffering from facial abscesses and neuralgia, argues, to say the least of it, the possession of great nerve. But Mr. Bartlett did not hesitate, and climbing up within reach of his patient he lanced the swollen cheek. His courage was rewarded, for the beast at once perceived that the proceedings were for his good, and submitted quietly. The next morning, when they came to operate upon the other side, the elephant turned his cheek without being bidden, and endured the second incision without a groan.

A CASE OF SUPERFETATION IN THE HORSE.—A few cases of superfetation have been collected, but they are so rare as to make the following one very interesting. It was reported in the Lyons *Journal de Medicine Veterinaire*. A mare about ten years old gave birth, at full time, to a foal. Soon after the throes of parturition recommenced, and with assistance another foal was brought into the world. Twin foals are sufficiently rare to cause astonishment at any time, but the astonishment of the attendants was changed into amazement when they discovered that it was not a horse foal they had taken from the mare, but an unmistakable mule. The little creature, unfortunately, and as is generally the case with twins in solipeds, did not long survive its birth. The veterinary surgeon who was subsequently called in, made inquiry into the case, and as a result he gives the following explanation: It is a very common practice in Dauphiny to present the mare, when in œstrum, twice to the stallion, and at a brief interval, believing that fecundation is more certain by this procedure. But, as it seldom happens that the villagers can obtain the services of a stallion which can serve the mare twice with only a few minutes between, or yet a second stallion, and as male asses are by no means scarce, they oftentimes employ one of the latter to succeed the horse. And this is what happened with the mare alluded to. The case is not absolutely unique, even in equine physiology, however, for Fleming, in his "Text-book of Veterinary Obstetrics" (p. 152), gives six similar instances, and one in which a mare, put first to an English stallion, and soon after to a Barb, produced twin foals—one resembling the first, and the other the second stallion. It may be noted that, of all the domestic animals, the mare is the least disposed to multiparity.

VETERINARY MEDICAL REGISTER

—OF THE—

UNITED STATES.

COMPILED FOR THE

JOURNAL OF COMPARATIVE MEDICINE.

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The accompanying Register has been compiled with much labor and care. It is believed to include a very large majority of the veterinary practitioners of this country. A supplement, however, will be issued in a subsequent number of the JOURNAL OF COMPARATIVE MEDICINE which will include all names sent to or secured by the editor during the ensuing three months.

We are indebted to a large number of medical, agricultural, and sporting journals for inserting our request that veterinarians send us their addresses. We are also indebted to Mr. W. H. Clark and to Mr. W. R. Jenkins, publisher, for supplying us with lists of names.

It will be seen that but few of the names have any titles appended. We have purposely put on the title D. V. S. only when there was evidence, from college catalogues or the written statements of veterinarians, that such title was due them. We have also only appended the title V. S. in cases where such title has been distinctly assumed in correspondence with us or others. There remains a very large number of persons who are put down in directories and elsewhere as veterinary surgeons, but whose exact title we do not know. We have, therefore, given them no title at all. All corrections in this matter of title we shall be very glad to receive, and they will he attended to in a subsequent edition of the Register.

In connection with the publication of this Register, we wish to call attention to a few striking facts regarding veterinary medicine in this country. There are in the present Register 898 names. We do not think that the total number of regular veterinary surgeons in this country greatly exceeds this. Of these —— there are, as nearly as we can estimate, not over 200 veterinarians who have received a regular professional education. The rest have picked up what knowledge they could in various ways, and have then assumed the title. Their education and professional skill is necessarily far below what could be desired.

Now, on the other hand, there were in this country in 1878 the following number of domestic animals:

Horses,	10,938,700
Mules and asses,	1,713,100
Cattle,	33,234,500
Sheep,	38,123,800
Swine,	34,766,100
Total,	118,776,200

A very low estimate of the value of the above is $2,000,000,000. This does not include dogs, hens, and other domestic animals. The annual loss among all these creatures from various diseases and injuries is simply immense.

From one disease alone, hog cholera, there has been an annual loss of, it is estimated, $200,000,000. Devastating epidemics are likely to break out any year.

The loss to exporters on account of pleuro-pneumonia was in one year about $2,250,000.

We place these vast moneyed interests on one hand, and the very small number of educated veterinarians, who form an important element in protecting them, on the other. The necessity for more skilled practitioners is apparent, and is, indeed, a crying one.

It is estimated that there are nearly twice as many physicians in this country as are really needed.

There are, on the other hand, probably not one-twelfth as many fairly good veterinarians as our commercial and agricultural interests require or as our sympathies with brute suffering should demand.

Addams, J. W., Cedarville, Ill.
Agenburg, G. S., Vermillion, Dakota.
Alba, P. F., Mobile, Ala.
Alexander, J., V.S., Manchester, N.H
Alger, D., Providence, R. I.
Allen, E. R., Toledo, Kansas.
Allen, G. W., V.S., Frankford, (Philadelphia) Pa.
Alloway, C. J., D.V.S., Montreal, Canada.
Andinwood, S. T., Albany, N. Y.
Arminger, J., Baltimore, Md.
Atchison, J., New York, N. Y.
Atherton, T. W., Rockland, Me.
Atkins, C. H., Chicago, Ill.
Atkinson, V. T., Milwaukee, Wis.
Audrain, H., D.V.S., Montreal, Can.
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Baker, J. D., Winafall, Ind.
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Baker, M. C., D.V.S., Montreal, Canada.
Baker, W., Brooklyn, N. Y.
Baker, W., Washington, D. C.
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Barker, G. D., Syracuse, N. Y.
Barker, M. O. Rochester, N. Y.
Barling, E., Utica, N. Y.
Barron, T. F. & Son, Baltimore, Md.

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Beal, F. E. S., Ames, Iowa.
Becker, ——, Brooklyn, N. Y.
Beech, ——, New York, N. Y.
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Bell, S. J., D. V. S., San Francisco, Cal.
Bell, W., Kars, Ontario.
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Bennett, P., Brooklyn, N. Y.
Bentley, H. A., Mountain City, Nev.
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Berkman, D. M., Rochester, Minn.
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Berry, J. B., Philadelphia, Pa.
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Bessey, C. E., Ph.D., Ames, Iowa.
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Birch, M. W., Philadelphia, Pa.
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Bovett, J. A., Chicago, Ill.
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Bowman, E. G., Pittsburg, Pa.
Bowman, E. P., Lynn, Mass.
Bowyer, G. A., Jr., Pine Grove, Ky.
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Brackett, G. H., Worcester, Mass.
Bray, P. A., Chicago, Ill.
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Brewster, B. S., Norwich, Ct.
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Burton, J. S., Hartford, Ct.
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Callum, C., Meadville, Pa.
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Cattanach, J. S., New York, N. Y.
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Chadwick, W., Chicago, Ill.

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Chevalier, J. B., Montreal, Can.
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Clark, L. J., Chicago, Ill.
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Cochran, D. W., D.V.S., New York, N. Y.
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Colburn, C., West Dedham, Mass.
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Colsson, P. Z., D.V.S., Mobile, Ala.
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Courtenay, P. R., Baltimore, Md.
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Crabb, C., Cleveland, O.
Craig, W. M., Chicago, Ill.
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Cutting, W., Rochester, N. Y.
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De Lebiouse, A., Virginia City, Neb.
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Delmed, —, V.S., Chicago, Ill.
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Derby, M. C., Manchester, N. H.
Derr, W. F., V.S., Wooster, O.
De Tavel, —, San Francisco, Cal.
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Duoglas, —, Brooklyn, N. Y.
Douglas, —, Jersey City, N. J.
Dowling, W., Detroit, Mich.
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Dunne, C., D.V.S., New York, N. Y.
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Dysart, S., Franklin Grove, Ill.
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Eck, M., Chicago, Ill.
Eckstein, G. W., Philadelphia, Pa.
Edwards, W. G., New Orleans, La.
Eggleston, W. M., Chicago, Ill.
Elkins, O. H., North Troy, Vt.
Elliott, J., Toledo, O.
Ellis, J. H., Philadelphia, Pa.
Emmett, C. F., New Orleans, La.
Ennever, W. C., New York, N. Y.
Esslement, W., New York, N. Y.
Estelle, J. T., Cincinnati, O.
Evans, G. A., San Francisco, Cal.
Evans, L. D., Munson, Ind.
Fair, W. C., Cleveland, O.
Fairchild, D. S., Ames, Iowa.
Faivre, C., Philadelphia, Pa.
Falen, T., Chicago, Ill.
Faley, M., Philadelphia, Pa.
Farley, O. C., D.V.S., Boston, Mass.
Farness, O. O., Ortonville, Minn.
Farrell, S., St. Louis, Mo.
Farwell, I. V., Lake Forest, Ill.
Fauria, —, Pensacola, Fla.
Fausse, A., Montreal, Can.
Fawns, C., Newark, N. J.
Fay, F. V., V.S., Millbrook, O.
Fenner, H., Newark, N. J.
Ferdinandson, J., Newark, N. J.
Ferrell, H. Y., Savannah, Ga.
Ferries, J., D.V.S., Beaverly, Ont.
Field, —, Chicago, Ill.
Field, H., Fall River, Mass.
Field, S. S., D.V.S., New York, N. Y.
Fife, C. C., Boston, Mass.
Finlay, —, New York, N. Y.
Finlay, R. W., New York, N. Y.
Finn, B., New York, N. Y.
Fitzgerald, E., D.V.S., New York, N. Y.
Flagg, O. H., New Bedford, Mass.
Flintoff, H. I., New York, N. Y.
Fly, J. C., Philadelphia, Pa.
Fogg, J. C., D.V.S., Boston, Mass.
Foote, H. F., New York, N. Y.
Foote, J. H., New York, N. Y.
Force, J. C., D.V.S., Newark, N. J.
Fordham, E., Brooklyn, N. Y.
Foreacre, M., Bolivar, O.
Frank, M., Baltimore, Md.
Frazer, —, New York, N. Y.
French, L., Williamson, N. Y.
French, W., New Orleans, La.
Frey, M. L., D.V.S., New York, N. Y.
Frey, R., St. Paul, Minn.
Frink, D. D., V.S., St. John, N. B.
Frink, J. H., V.S., St. John, N. B.
Frisom, O., Omaha, Neb.
Fuller & McIlroy, Grand Rapids, Mich.
Fuller, R. C., Dayton, O.
Gadsden, J. W., M.R.C.V.S., Philadelphia Pa.
Gaffley, A., Kansas City, Mo.
Gaines, J., Saco, Me.
Galt, J. B., Morrison, Ill.
Gantz, P., Chicago, Ill.
Garity, P., Chicago, Ill.
Garman, J. G., V.S., Union Station, Pa.
Gaulding, F. L., Port Huron, Mich.
Gerety, M., St. Louis, Mo.
Gerth, J., Jr., Newark, N. J.
Gibbs, W., St. Mary's, Ont.
Gibson, G., Pittsburg, Pa.
Gifford, C., New York, N. Y.
Gillett, I. M., Jr., Spencer, Ill.
Girard, F., Philadelphia, Pa.
Glasgow, T., Philadelphia, Pa.
Goad, H. A., Columbus, O.
Going, J. A., M.R.C.V.S., New York, N. Y.
Going, J. B., Fort Clark, Texas.
Gosling, J., Columbus, O.
Gottleib, A. T. E., Utica, N. Y.
Gove, J. C., Hampton Falls, N. H.
Greenside, F. C., V.S., Toronto, Can.
Gregson, J., St. Louis, Mo.
Greiner, L. A., Indianapolis, Ind.
Grice, J. C., New York, N. Y.
Grun, J. B., Montreal, Can.
Guenther, F., St. Louis, Mo.
Guesinger, A., Chicago, Ill.
Haas, J., Dayton, O.
Haas, J., Indianapolis, Ind.
Haensler, J., Buffalo, N. Y.
Hall, C. H., D.V.S., New York, N. Y.
Hall, C. P., New York, N. Y.
Hall, C. P., Swanton, O.
Hall, R., New York.
Hall, R. C., Webster, Mass.
Hall, R. W., D.V.S., Fanwood, N. J.
Hall, W. B., Quebec, Can.
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Harvey, G. W., Boston, Mass.
Hastings, S. B., West Finley, Pa.
Hawk, J. W., Newark, N. J.
Hawkins, J., Detroit, Mich.
Haydon, W. B., Newark, N. J.
Heard, E. H., Brooklyn, N. Y.
Heard, J., Cleveland, O.
Heard, J. M., M.R.C.V.S., New York, N. Y.
Herbert, S., D.V.S., St. John, P. Q.
Heischman, ——, Gahanna, O.
Herser, E., Pottsville, Pa.
Herst, W. C., V.S., Ashtabula, O.
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Herr, L., Lexington, Ky.
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Herr, T. J., D.V.S., New York, N.Y.
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Hindekoper, R. S., Philadelphia, Pa.
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Hison, W. C., V.S., Dixon, Ill.
Hetchman, W. H., Philadelphia, Pa.
Hodgdon, C. A., Lancaster, N. H.
Hodgson, T., Toronto, Can.
Hoeing, C. F., Jersey City, N. J.
Hoffman, J. J., Philadelphia, Pa.
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Holladay, H. M., Detroit, Mich.
Hollman, ——, Brooklyn, N. Y.
Holpape, ——, Hoboken, N. J.
Holzschurch, H. H., New York, N.Y.
Homberg, J., New York, N. Y.
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ORIGINAL COMMUNICATIONS.

ART. XV.—HAVE BIRDS THE FACULTY OF ARTICULATE SPEECH?

THAT birds, like other animals, have the power of conveying ideas by sounds scarcely admits of a doubt, and that others are capable of learning words from human languages, is well known by the familiar examples afforded by ravens, parrots, etc. The question which I shall ask, however, is: Do they have the faculty of communicating ideas to each other by means of words analogous to the faculty of speech possessed by man? It may be impossible, at present, to answer this question; but there are facts in our possession which go far towards its elucidation, and some of the more important of these I propose to bring to the notice of the readers of this journal.

Bechstein* has very thoroughly studied the notes of the nightingale, and has ascertained that this bird, in the course of an hour or two, enunciates over forty distinct sounds, which are representable by letters of our alphabet. In the vocabulary of this sweetest of all singing birds there are double consonants, vowels and double vowels.

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* Naturgeschichte der Hof und Stuben vogel Art. Nachtigall.

In attempting to represent the song of the nightingle, Bechstein writes it as follows, the letters having the sounds given to them in the German language: "Tiore, tiore, tiore, tiore—Spe, tiore, aqua—Tio, tio, tio, tio, tio, tio, tio, tio, tix—Contio, contio, contio, contio—Squo, squo, squo, squo—Tzu, tzu, tzu, tzu, tzu, tzu, tzu, tzu, tzu, tzi—Corror, tiou, squa, pipi—qui—Zozozozozozozozozozozozo, zirrkading!—Tsissiri, Tsipisisisisisis—Dzorre, dzorre, dzorre, dzorre, hi—Tzatu, tzatu, tzatu, tzatu, tzatu, tzatu, tzatu, dzi—Dlo, dlo, dlo, dlo, dlo, dlo, dlo, dlo, dlo—Quio trrrrrrrrr itz—Lu, lu, lu, lu, ly, ly, ly, ly, lie, lie, lie, lie—Quio, didl, li, lubylie—Hagur, gurr, quihio, coui, coui, coui, coui, qui, qui, qui, qui, qui, qui, qui—Goll, goll, goll, goll, guia hadadoi—Couigui, horr, ho, didia, dill, ei—Hezezezezezezezezezezezezezezezeze couar ho dze hor—Quia, quia, quia, quia, quia, quia, quia, quia, ti—Ki, ki, ki, io, io, io, ioioioio, ki—Lu ly li le lai la leu lo didl io quia—Kigaigaigaigaigaigaigaigai, guiagaigaigai coruor dzio dzio pi.

Here we find all the vowels of the languages of European nations, and all the consonants except *b*, *f*, *m*, *n* and *v*. It would be presumption for us to deny that the syllables enunciated are entirely without meaning, and that the nightingles do not understand the sounds that are uttered by their fellows. The idea that the song of the nightingle is nothing but a song, without any other motive than the gratification of the musical taste of the singer, appears to me to be entirely unsupported by analogy, either when compared with man or with other animals. All sounds, musical or not, though occasionally emitted for self-gratification, have no such object as their primary motive. This latter is the influencing of others, either for the purpose of alarming, pleasing, or moving them in some other way; and it would be, I think, unwarrantable to deny the existence of a like consideration in birds, and this especially when so elaborate a system as that of the nightingle is in existence.

In his remarks on the subject of the vocalization of which birds are capable, Houzeau says:

"The language of birds contains a notable part of the letters of the alphabet, and even the double consonants are employed, such as *dz* and *db*. There are also simple vowels and diphthongs. The greater part of the consonants used are combined with vowels as initial letters of syllables. The use of consonants after vowels, as final letters, is much more rare, the letters *l*, *n* and *r* being the only ones which figure in this situation. But, from the lack of various letters and of combinations or syllables, we are not to conclude that there is a total absence of articulate sounds. We ourselves do not make use of all possible combinations of final consonants after a vowel. Many nations do not even use all the letters, and cannot even pronounce those which do not enter into the composition of their alphabets. Several African languages do not contain *r*. The Chinese not only do not have this rolling consonant, but they lack also other simple consonants, as *b*, *d*, *v*, *z*. They pronounce Holland *Golanki*, and France *Fulantsus*. The Polynesians do not have the sibilant *s*. They do not place consonants after vowels in the same syllables, so that all their words end in vowels. The Hurons have none of the labials (*b*, *f*, *m*, *n*, *p*, *v*), and the vowel *u*, which is articulated by the lips, is also wanting. Garcilasso says that the Peruvians not only do not have the letters *b*, *d*, *f*, *g*, *z*, *x*, but that they do not even form a single double consonant. The Feejeans do not possess the *c*; the Pomo Somos the *k*, or the inhabitants of Rakiraki the *t*. The Australians have no *s*. The Indians of *Port au Francais*, in British Columbia, lack the letters *b*, *d*, *f*, *j*, *h*, *v*, *x*. But the poorest of all people in articulate sounds are those of New Zealand, whose alphabet does not contain the twelve following letters: *b*, *c*, *d*, *f*, *g*, *j*, *l*, *q*, *s*, *v*, *y*, *z*, and the double letter *x*."

Thus we see that the nightingle possesses a larger literary capital than do several nations of men, and I therefore submit that there is nothing at all improbable in the view that it has also the faculty of communicating, by means of articulate speech, the ideas which its brain elaborates. It must be borne in mind that the cerebral structure of birds is simple when compared to that of higher animals. In proportion to the size of its body, however, the brain of the nightingale is large; and that part which is in man supposed to be connected with the faculty of speech, is more developed than the corresponding part in other birds.

That birds, in common with other animals, convey ideas by sounds no one probably disputes; but I contend that in all probability they go beyond this, and approach, though of course remotely, the powers of man in this respect.

I venture to conclude with the following anecdote, which I quote from Houzeau, who accepts it as true:

A farmer on Long Island, in the State of New York, wounded a wild goose as it was passing south on its winter migration. The bird was soon cured of its injury, and was content to remain with the tame geese belonging to the farmer. In the spring, one day, as a large flock of wild geese were flying over the farm on their journey north, the bird heard their cries, and at once took flight and joined them. But the following autumn the wild geese suddenly appeared among the tame ones of the farm. One was the wounded goose, which had returned, bringing two others with it, and they all remained with the companions of their choice.

WILLIAM A. HAMMOND, M.D.

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ART. XVI.—VETERINARY EDUCATION.*

IT has long been the custon to open a course of medical lectures with a formal Introductory Address. In the opinion of many it is very beneficial to the college to assemble its friends—the alumni and students—together and in a social way discuss some subject in which all have an interest. The thoughts which I have imperfectly compiled for our present consideration are somewhat desultory, but in the main they bear especial reference to the subject of Veterinary Education.

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* Abstract of an Introductory Address delivered by ERSKINE S. BATES, M.D., D.V.S, on the occasion of the opening Fall Term, October, 1881.

Several attempts have been made in this country to establish colleges or schools devoted to the science of comparative medicine and surgery, or what is more popularly known as veterinary medicine.

The first and earliest of which I can find any record was made by Robert Jennings, of Philadelphia. Dr. Jennings was not a graduate either of human or comparative medicine, although he was at that time and had been for many years a successful practitioner of the veterinary art. He had the reputation, however, of being well informed on medical subjects.

In the winter of 1846, during the sessions of the human medical schools, he gave a course of veterinary lectures in Philadelphia to a small class of medical students.

These lectures were continued thereafter for several years, or until the year 1850, when he conceived the idea of organizing a veterinary college. At first he received but little encouragement from those to whom he broached the subject, but finally, through the support of four human physicians, a doctor of divinity and several prominent citizens of Philadelphia, he succeeded in obtaining a charter for an institution called the Veterinary College of Philadelphia. The act granting this charter was approved April 15, 1852, nearly thirty years ago, and marks the date of the birth of the first veterinary college in America. This effort was evidently premature, for the college organization survived but a short time, dying with evidences of internal trouble and lack of pecuniary vitality.

About this period (1851) G. H. Dadd, of Boston, another self-made veterinary surgeon began publishing a veterinary journal. It flourished one year, experienced a severe collapse, finally was revived in 1855, and lived on for three years more. With the resuscitation of the journal in 1855, Mr. Dadd succeeded in obtaining a charter from the Massachusetts Legislature establishing the Boston Veterinary Institute. G. H. Dadd, C. M. Wood, R. Wood, and A. S. Copeman, (all practising veterinarians,) constituting the faculty and forming the editorial corps of the journal. The journal and institute both succumbed before completing the first dentition. The causes which led to this catastrophe do not plainly appear.

Dr. John Busteed, a human physician practising in this city, who had long been an enthusiastic student of comparative science, then tried his hand at the business of college making. In 1857 he succeeded in obtaining a charter by special act of the Legislature, establishing the college known as the New York College of Veterinary Surgeons. The doctor seems to have been a very persevering, earnest, enthusiastic man. Through his personal efforts sufficient funds were raised by private subscriptions to erect a handsome and commodious building on Twenty-third street, near Sixth avenue.

Dr. Busteed, assisted by two graduates in veterinary medicine, constituted the faculty at the opening of the college. For some reason they failed to serve the purpose when tried as teachers and lecturers. The college soon closed its doors and was afterwards sold and used for a livery stable. The building was finally destroyed by fire in 1865.

Nothing daunted by the failure of his first effort, Dr. Busteed continued to agitate the necessity and importance of having facilities in the United States for obtaining a knowledge of veterinary science.

In 1862 he procured an amendment to the old charter of 1857, and in 1864, two years later, having succeeded in organizing a new Board of Trustees, and forming a new faculty, he began another course of lectures.

The first term opened with one professor and three lecturers. Seven students matriculated during the term.

The history of this effort at establishing a veterinary college is a somewhat remarkable one.

During its first session, it counted seven students. In 1868, four years later, it had only one student during the entire term. In 1873, it had eighteen matriculants. The college suspended work, after an existence of ten years, at the close of the session of 1874–'75—the cause of its demise being internal disturbances, brought on, no doubt, by the perversity and peculiar character of its Board of Trustees.

In this connection, it is but just to say that Dr. John Busteed seems to be entitled, in every respect, to be called the father of veterinary medicine in this country. He seems to have done more than all others combined to agitate, popularize, and bring his subject before the people and the government of the country. Such enthusiasm, energy and perseverance as he carried into the cause, are worthy of the commendation, remembrance and imitation of all those who aspire to the title of D.V.S.

During the lifetime of the New York College of Veterinary Surgeons, the subject of veterinary education was being agitated in various parts of the country, and the discussion was bearing some fruit.

In 1862, the Ontario Veterinary College was organized, and the first course of lectures given in Toronto, Canada. This school is nominally under the supervision of the council of the Agricultural and Arts Association—Prof. Smith, a veterinary graduate of the Edinburgh school, being the Principal. From the opening lecture to the present time, the school has been a success. It has graduated 282 veterinary surgeons during its nineteen years of existence, and has a large class of native students.

In 1866, the Montreal Veterinary College was established as a veterinary department of the McGill University, under the direction of Dr. McEachran, F.R.C.V.S. This department has been in successful operation ever since its organization, having graduated about fifty students during the last fifteen years.

Between the years 1868–'73, the Illinois University, Cornell, Amherst, and Ohio Agricultural Colleges established veterinary departments. Later, the Maryland, Pennsylvania, Iowa, and Vermont State Agricultural Colleges tried to carry a veterinary course of lectures, as did also the Boston Institute. In tracing the history of these efforts, I have been forced to conclude that they all resulted in failure. At Cornell, even, the degree D.V.M. was conferred on only two students since the department was established.

A veterinary tail attached to an agricultural or literary kite seems to be destined to a very brief existence, or else is soon so overshadowed by its more popular associate that it quickly becomes too weak to be of any practical consequence. It seems to be a law of nature that the greater absorbs the less; the more popular gradually eclipsing the less attractive and unknown. Our whole educational history is filled with illustrations of this fact. Independent special schools grow strong and vigorous; departments and attachments of various kinds become beautifully less, and finally cease altogether, or exist only in name. Our law schools, and medical colleges, and institutes of divinity succeed and develop into strong, healthy seats of learning and science, just in proportion as they stand on a single broad, firm foundation, and are managed on the one idea principle, upheld and supported by teachers whose souls are in their work.

I stated that the N. Y. C. V. S. practically ceased to exist as a college in the Spring of 1875, or at the close of the term of 1874–'75.

The result of her demise was the birth of the American Veterinary College of New York, under the direction and management of Prof. Liautard. Born in April, 1875, the American college has continued its lectures up to the present time, graduating seventy-two D. V. S.'s during the six years it has been chartered as a college, and doing good work in the cause of veterinary education.

In 1877 an effort was made by the trustees to again revive the New York College of Veterinary Surgeons. A Faculty was constituted and one course of lectures delivered to a respectable number of students. The course of the trustees, however, again created dissatisfaction, and the Faculty, realizing that they could no longer retain their self-respect and continue their labors, resigned in a body. To-day, the N. Y. C. V. S. is a wreck, existing only in name, her halls deserted, her laboratory, museum and apparatus destroyed or scattered beyond redemption. Her final convulsion brought into existence our own Columbia.

Youngest of all the veterinary family, she aspires to be the leading authority in all that pertains to the advancement of veterinary education, and the development of our knowledge of comparative medicine. Established on a broad and liberal basis, she stands on her own merits, has implicit faith in the ability of her

Faculty to teach the most advanced principles of veterinary medicine and surgery, points with pride to the quality and character of her alumni, and takes the deepest interest in all that relates to the progress of her pupils. Such, in brief, is the history of veterinary medicine up to the present time.

Let us now for a moment consider what has been accomplished, and learn the status of our present condition.

In the first place, whatever has been done has been accomplished by personal individual effort.

Government, which in England, France and Germany is exceedingly liberal and generous in the support of veterinary science, has done nothing for us. In no practical form has there been even sympathy or encouragement manifested outside of the veterinary and human medical professions. If I mistake not, in every instance, with a single exception, those who acted as the Faculty of the colleges to which I have referred had to assume the pecuniary burdens. All honor to such pioneers as Jennings, Dadd, Busteed and their colleagues. They paved the way and made it easier for those who have come after them.

Less than a quarter of a century ago veterinarians and veterinary science were almost an unknown quantity. To-day we have in Canada and the United States four schools or colleges in successful operation, with a total attendance of a little over three hundred pupils. Interested in teaching and raising the standard of veterinary education are forty-three human and comparative physicians, many of them men with a national and trans-Atlantic reputation, all of them recognized in the world of science for their high standing and professional attainments.

There are three journals (two monthlies and one quarterly) published in this city devoted to the advancement of comparative medical science and the interests of the veterinary art, and I think I do not exaggerate the facts when I say that they are rapidly approaching in general character and quality the best journals of the same kind published across the water. It is not much over fifty years since we could boast of having a really well-educated veterinarian within our borders. To-day there are between eight hundred and a thousand men engaged in the practice of veterinary profession—probably a little over eight hundred all told. This number is composed of regular graduates of the veterinary school, of human physicians, self-educated veterinarians, licentiates and quacks. The graduated human and comparative physicians number about five hundred—over half of the entire number.

The self-educated constitute a small minority, probably not over twenty at most. By the term self-educated I refer to a class of intelligent men who long ago, seeing a lucrative business in veterinary practice, armed themselves with a library and diligently studied it until they had practically mastered all that was known on the subject.

Such men always command my respect, and I never fail to extend to them the right hand of fellowship.

The licentiates are those who have been examined by the censors of the New York County Veterinary Medical Society, and have been found sufficiently well-informed to be granted a license to practice in the county in which that society has jurisdiction. The number of licentiates is about forty.

Deducting these men and the graduated veterinarians from our total number, and we have left quite an army of irregular practitioners or quacks. By the term quack, I mean men who have not the first idea of what constitutes a diseased condition or how to treat it. They fire and blister and bleed and cut and drench and dose, regardless of the pain, torture, deformity or death that may follow. Such men not only injure and destroy the animals unfortunate enough to fall under their care, but they injure seriously the reputation and business of those who are thoroughly competent and properly qualified by years of training, close observation and hard study.

In the present dearth of good veterinarians there is no remedy for this evil. We can only work and wait, hoping that in the onward march of veterinary medicine the quack brigade will become extinct.

Our most useful and valuable animals are now less often subjected to uncalled-for medication and cruel surgical operations than heretofore, and they will be still less so as the number of competent veterinarians increases.

Just in proportion as this change takes place, will the importance of veterinary science be more and more esteemed, and its worthy practitioners respected. Even now the line is being sharply defined between the regular and irregular practitioner—only the graduates of the schools being recognized as sufficiently competent to give evidence as experts in the United States Courts, and to receive appointments in the army.

Twenty-five years ago, even in Europe, the veterinary profession was a most humble one, and recruited from the very lowest of the educated classes. Scarcely any of its members were received into decent society, and certainly none could ever hope to rise to any social eminence. What a contrast we have in the present status of the veterinary practitioner!

The profession has been raised out of the dirt; the curriculum of the veterinary colleges has been extended and made more liberal; the examinations are searching, and the diplomas only given to such as are thoroughly qualified. The British Parliament has recently enacted a bill forbidding any one to assume or use the title of veterinary surgeon, or to practice veterinary medicine and surgery except he has a diploma or license from the proper authorities. Their social standing (a point on which Englishmen are often sensitive) has been materially raised. I read, not long since, that the Prince of Wales had invited an English veterinarian to dine with him, in order to give social recognition to the veterinary profession.

In the United States, the social position of veterinarians does not depend on the recognition of prince or potentate, but on the kind of training our young men receive and the character and reputation they develop in their professional life. If properly educated, they will continually add to the dignity and distinction of the profession, eventually placing it among those most cultivated by gifted minds.

This feature is well illustrated by an incident in the late International Medical Congress. Prof. Pasteur read an address on Animal Vaccination which created the deepest interest of any paper read before that august body. It not only affected profoundly the medical savants before whom it was read, but it occasioned widespread discussion in the agricultural and scientific world. At its close, Sir James Paget thanked him in the name of the International Medical Congress and the English people, explaining that he had done and was doing for the lower animals just what Jenner had done for the human family. Pasteur's theories if they bear the test of practical application, certainly promise to reduce to a minimum the contagious diseases of animals and introduce us to a prophylactic agency of the utmost importance to both comparative and human medicine. Veterinary science thus scores another triumph in the cause of human progress. It is conceded that the most important discoveries in human medical science have originated, directly or indirectly, from observations on animals. In my opinion, there is very little doubt that it is in comparative medicine that we are still to find our grandest fields for original investigation and research. Let us hope that some who are listening here this evening will yet surprise the nations with the importance and extent of their discoveries in veterinary medicine. Bear in mind, however, that such tasks and results require gifts of a high order as well as the most rigid and thorough medical training.

In my opinion, two things have done more than all other influences combined to push medicine forward as a science during the last fifty years, during which time the real advance that has been made eclipses all that had been previously known.

These two things are, first, the study of the gross and minute lesions of the body in connection with well-applied logic as to the real nature of morbid actions; secondly, experimental pathology and therapeutics. By experimental pathology I mean well-considered operations upon the lower animals with a view to studying the *modus operandi* of morbid force and the result it produces.

Experimental therapeutics is part and parcel of experimental pathology, advancing hand in hand with it. The two are inseparably connected. For we no sooner discern the nature and extent of a morbid process than we are eager to set in operation some antagonizing agency to counteract it.

Our present therapeutical advances are almost wholly based on the observations which have been made on animals in diseased and healthy conditions. To the veterinarian properly belongs the investigation of diseases in the lower animals.

Who is so well qualified as he to observe, collect and digest the effect of drugs in controlling such disease?

I assure you, gentlemen, who are just beginning, and those already engaged in the study of this noble and important profession, that there is no department of medical science possessing such broad and untrodden fields, so rich in future promise as those to which I have just referred.

Much as we have lately discovered concerning the diseases of animals and their relation to the human family, much more is still to be learned, and each item of information gleaned will be of positive pecuniary advantage both to the discoverer and the country at large.

Let me illustrate the pecuniary point by referring again to Prof. Pasteur's germ theory. France loses every year by splenic fever animals to the value of 20,000,000 francs. If his researches and experiment bear the test of practical application the total 20,000,000 francs will be saved to that country. Again, in Holland the dreaded pleuro-pneumonia has been kept under complete control by the veterinary corps. How? By innoculation and isolation; comparative medicine thus saving that country from immense losses in valuable property.

When viewed in connection with such results, the veterinarian assumes a position of the first magnitude, and his professional work becomes of the highest importance.

Most of the enlightened nations, except our own, appreciate such labors at their full value. France annually appropriates 750,000 francs towards the support of veterinary education. She has a graduated veterinarian for every 1,100 head of her equine property. Germany has 1,300 graduated veterinary surgeons, one to every 1,500 horses. Even Egypt manifests a commendable interest in the welfare of her domestic animals. The United States has one graduated veterinarian for every 200,000 of her domestic animals.

The necessity for recognizing the existence and utility of veterinary sanitary science was never greater in this country than it is to-day. It is to the increasing herds in the great West that not only England, but a large proportion of the people of Europe, must, to a considerable extent, look for their animal food in the immediate future. If the countless herds roaming the great western plains of our vast continent are to be protected and preserved from the ravages of the great animal plagues, veterinary science must furnish the skill and numbers to do it.

There is another branch of veterinary and human medical education which has made in the past few years, and is still making, great advances—I allude to the art of preserving health, prophylactic medicine, sanitary science.

The importance of these subjects has gained greatly in popular estimation. Public opinion realizes that it is more economical, as well as more scientific, to prevent disease than it is to cure it. Sanitary veterinary education, although yet in its infancy, covers a broad domain of useful importance.

It is in this field that the comparative physician is destined to achieve the most marked distinction. National, state, city and town Health Boards are forming all over the country. Without the services of a well-educated veterinarian they are deprived of half their strength and usefulness.

It is a pretty well established fact that a large proportion of the contagious and infectious diseases are preventable in human beings as well as in the lower animals. There is also no longer any question that many of the diseases to which mankind is subject are directly traceable to diseased conditions existing in some of the domestic animals which furnish our food supplies.

This truth is of especial importance to the American public, for we are an eminently meat-eating people. Let me illustrate this point. In England seventy-one of the recent epidemics were traced directly to an infected milk supply. Fifty of them were epidemics of typhoid fever, and caused the sickness of 3,500 people. Scarlatina scored 14, and counted 800 victims; diphtheria 7, and afflicted 500 victims. It is estimated that a tuberculous milk supply will tubercularize 50 per cent. of the children unfortunate enough to feed upon it. If that source is to be cut off and disease to be prevented, the Veterinary Sanitary Inspector becomes an important factor in the work. A veterinarian should not only be able to treat and cure the diseases of animals, but he should be thoroughly familiar with, and quick to detect, all the pathological conditions of diseased flesh.

The educating of young men so that they are competent to inspect all articles of animal food thus becomes of very great importance to us as a people. Not only the individual health of the nation is involved, but vast moneyed interests are at stake.

Within the last year great consternation and discussion followed when England scheduled our cattle, and Germany and the Latin nations put an embargo on the importation of pork from the United States. I believe that those governments were justified in such action. The cheapness and abundance which abound in this country promote the evils of which they complained.

When the diseased meat of cows, calves, sheep and swine can be bought for one-half or two cents per pound and made up into bologna sausages which wholesale at ten and retail at fifteen or twenty cents per pound, there will be plenty of men engaged in a business so lucrative, regardless of consequences. We have been quietly investigating this subject during the past two years, and have had specimens forwarded to us secretly from the manufactories, which, on examination, proved to be the livers of cattle ulcerated to such an extent that the pus could be squeezed out of them like honey out of the honeycomb. Huge cancerous masses have fallen in our way. Kidneys in advanced stages of suppuration and various portions of the body which were literally honeycombed with vast numbers of parasites.

In these manufactories—and they are generally carried on under cover—nothing is wasted, and it would seem the greater the amount of disease the more succulent and juicy the material prepared from it.

Even the old, worn-out and diseased horses are eagerly purchased, and in the form of equine stew, made to furnish a valuable material for fattening hogs.

In view of some such facts as these which have fallen under my observation, it will not seem strange that unusual maladies are directly traceable to our animal food, or that contagious and strangely fatal diseases are developed in various sections of our own country.

Do not understand me as saying that this condition of things is general. What I do say is, that I have learned enough from my observations to declare positively that there is sufficient leaven in this subject to leaven the whole lump. This matter is assuming such an important and formidable character that the inspection of our animals should be of the most rigid character, both before and after slaughter.

This is a subject that directly affects our export trade; a matter of no small moment to us as a people. The exporting of live stock and animal products involves immense results, and bids fair to become of more importance than the export trade of King Cotton. During the year 1880 there were exported 83,434 hogs; 18,756 horned cattle; 3,060 horses; 5,198 mules; 209,137 sheep, besides fowls, etc., at a total valuation of $15,882,120. The value of animal products exported during the same year was $145,251,256. Total of live stock and animal products, $161,140,376. The value of cotton exported and also produced during the same time amounted to $221,517,323.

If the present increase continues our exports in live stock and animal products will, in a few years, exceed those of the cotton interests. Such statistics preach the most effective sermons. They tell us, in most unmistakble terms, that veterinary sanitary inspection should be more general than it is; that it should be extended to every section of the country, and that it must be done if we are to meet and suppress the gigantic losses and evils which now threaten us through diseased animals.

To my mind the first step that should be taken in meeting this condition of things, should be the educating of our young men thoroughly and well in the science of Comparative Medicine and Surgery, and especially in the department of Comparative Pathology, or a knowledge of the effects of disease, immediate and remote, on animal flesh. All of us are directly or indirectly thus interested in this question of veterinary education. I have no doubt that in the near future this question will receive from the general public the attention and recognition that its importance demands. A country with such extensive and far-reaching moneyed interests at stake; a country which can produce an Iroquois, a Maud S., or whose cattle are represented by such queens of the bovine family as Jersey Belle, will, ere long, have a veterinary army which in numbers, general intelligence, professional skill, and gentlemanly bearing, will challenge the world.

Gentlemen, many of you are listening this evening to your first lecture in your veterinary education. Let me impress on your minds that the profession of comparative medicine and surgery is not one whit less humane, noble and important than its sister science, human medicine. Human physicians everywhere recognize the great value of trained skill and professional knowledge which is included in the terms veterinary science and graduated veterinarian. They welcome the veterinary physician and surgeon as a brother practitioner, engaged in the same grand crusade against pain, disease and death, and they will extend to you such professional courtesy and social recognition as your knowledge and general reputation command. See to it, then, that you so improve your time and opportunities that when you graduate from these halls, that by your scientific attainments and gentlemanly bearing you are fully equipped and prepared to join forces or take honorable issue in the progress of a common warfare. Your development here, your student life is the embryo of your future career. Such habits as you form and fix here will make or mar your success hereafter. So far as you yourselves are concerned, you cannot overestimate the importance of the work you accomplish. To secure the greatest benefit from your instruction, you must early learn to make haste slowly and steadily. Do not be over anxious to get clinical knowledge. I know how much more interesting and exciting it is to see a case of lively colic than it is to read about it.

Of late years we have been inclined to overdo this matter of clinical teaching, and we are in great danger of turning out a class of graduaes who are litttle, if any better than the grooms and superannuated stablemen who claim to be so skilled in treating animals, and whose whole knowledge is based on the cases they have seen.

Learn the principles of your profession first and make the practical application follow. Post up thoroughly in anatomy, physiology, histology, pathology, chemistry, microscopy, etc., before you attempt a differential diagnosis between an ulcerated schneidenan membrane and a doubtful case of glanders. Too much clinical instruction and too little didactic teaching tends to make professional dwarfs.

Carefully fixing in the mind the most important principles and facts of veteninary science, and crowning the work with practical observations, cannot fail to make you giants in your profession. The power to observe and investigate things accurately is of primary importance. An uncultivated person is very apt to think it is an easy matter to make a correct observation or a careful investigation. It is, however, extremely difficult. Observation requires peculiar skill and great attention.

So many things are to be considered, and there are so many sources of fallacy, that comparatively few men are capable of such work, and as a consequence very few complete observations have been collected. In veterinary science every student should educate all his senses, and especially train himself in the habit of making careful and accurate observation.

All who have studied medicine are, I believe, prepared to admit that the education of a professional man is never completed. No one has ever mastered all the phenomena of disease, and no one ever will. There is always some new truth to learn, some new complication arising to tax our skill and test our ingenuity. Students are very apt to forget this fact, and appear oftentimes to conclude that they are sufficiently educated when they have attended a few lectures and demonstrations, when they have seen a few cases in the infirmary and obtained the requisite number of signatures to a diploma. It should be your ambition, as it certainly is your duty, to obtain all the knowledge and skill possible during your sojourn here. Every day should find you better fitted for the prevention and cure of disease, but you should accept as a cardinal fact that one of the most important results of your college course will be the mental training which teaches you how to learn. While gathering and memorizings facts and principles here you are becoming disciplined in habits of study which will be of the greatest possible benefit hereafter.

Veterinary science offers you great opportunities and grand possibilities, but to make a success in it brains are needed, plenty of brains, and they must be well cultivated too. Thick heads and thin skulls may survive the intricacies of theology or the subtilities of law. The boy who is fit for nothing else may do for a human physician, but he will make a dead failure as a veterinarian.

But I forbear. The limits to which I am assigned will not permit me to continue this subject further.

On behalf of the faculty I extend kindly greeting to those who have returned to us for a final struggle with the knotty and difficult problems of veterinary science, and at the same time I welcome our new friends to a term of earnest labor and profitable acquaintance with the curriculum of Columbia Veterinary College.

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ART. XVII.—THE EXPANSION OF THE HORSE'S FOOT WHEN SHOD AND UNSHOD.

PREFATORY REMARKS.

Horseshoeing was first practiced by the Arabs, and from that time until recently the necessity for protection to the foot from wear and tear has seldom been doubted by sensible men in any country, the only difference of opinion having existed in the form of shoe, and in the manner of fastening to the foot.

The first shoe used seems to have been nothing more than an oval piece of sheet iron with a hole in its centre; but its form had soon been changed and made square at the heels. Both forms, however, seem to have been fastened on by some device other than by nailing, from the fact that the holes representing the nail-holes of the present shoe in use were buttonhole, or longitudinal shaped from within outward toward the edge.

It also appears that the English were the first to adopt shoes open at the heel and centre of foot, and nailed as at present. This seems to have been the first material improvement, though the Moors, the Persians, and Portuguese had priorly made important changes from the Arabian pattern. For a long time very little improvement had been made, but within the last half century horseshoeing has attracted almost universal attention, as well among the ablest veterinarians as among a class of men calling themselves veterinary surgeons, but who possess neither theory or practical skill—enthusiasts, such as are found among all professions. The veterinary profession, however, seems to suffer more from quackery than all others combined, for every town, city and country vicinity are cursed by this class of men, who are, in fact, more dangerous than disease is to the horse. If advised to study the profession, they become very indignant, and tell you they have been raised with and among horses, have used them all their lifetime, therefore know all about them and their diseases, and especially are they posted, as they term it, in regard to the foot; and from time to time have invented the most senseless theories and forms of shoe; while others of the same class have contended that the horse could have been worked and ridden upon the hardest and roughest roads unshod without injury.

But all such senseless theories, and as many forms of shoe, have given way to the old concave-seated shoe, whose only objective feature is the nailing down of an elastic foot to an unyielding piece of iron called a shoe, with four stout nails on each side which prevent its natural expansion and contraction, and is the cause of all the evils incident to the shod foot; therefore shoeing in the past has been no more or less than a necessary evil.

From the earliest date in shoeing to the present, it appears that every man of judgment who paid proper attention to the matter, saw and admitted that the foot is an elastic pedal organ, expanding when pressed on and resuming its normal form when relieved from such pressure, and that any form of shoe which impeded its expansion and contraction must in some way be detrimental to its healthy condition. Indeed, this idea must force itself upon the most obtuse mind when we consider the admitted fact that, except by accident, the colt's foot is free from contraction, corns, and other evils until being shod.

Scarcely is a man to be met now-a-days, who pretends to anv knowledge of the horse, who is ignorant enough to not admit the above facts, and to that end scores, if not hundreds, of different formed shoes have been devised, and for a time used, but soon laid aside as useless for the purpose they were intended, all having failed to permit the foot to expand and contract in violent action, while others proved directly injurious by their first application.

The mode of fastening the different formed shoes to the foot has been and still is, perhaps, the greatest difficulty in safe shoeing. Still, in both the shape and manner of fastening, every inventor of horseshoes, except, perhaps, two, have had an idea that the foot should be permitted to expand when pressed upon, and to contract as soon as relieved of such pressure. One of the last named fastened his shoe with clips turned up at the toe and sides of the foot. Of course, no foot could have long endured such pressure, so it was promptly thrown into disuse; another bright genius fastened his shoe on with wire bands, and shared a similar short existence. Indeed, quacks are not alone responsible, for many of the profession are found among the inventors of such devices of torture.

Every veterinarian of respectable standing in the profession is competent to intelligently name the different organs composing the foot; but this is not all sufficient; we must also know and be able to explain the relation of each to the others as a whole, and especially to the organs with which they are in contact; how each organ is produced, and how reproduced whenever destroyed by wear and tear or accident. That is to say, all which are susceptible of being produced and reproduced by others. This knowledge we must possess before we are competent to apply a shoe to the foot that is not, as heretofore, a necessary evil.

And although the idea that a shoe which permitted the foot to expand and contract had been impressed upon the minds of the inventors of shoes by the force of theory set forth in books by able writers, it brought no relief to the dumb sufferer from malpractice, if I may be allowed the appellation for bad shoeing. For men still ignorant of nature's adopted means for the expansion of the foot got it into their minds that frog pressure was the only means of expansion by coming in contact with the ground, therefore nine-tenths of all the foolish devices in shoeing have been based upon the theory of frog pressure ; and, indeed, many learned veterinary surgeons have been fooled into the idea, and had their force of thought unfortunately turned in that direction. But these, on failure to provide a suitable shoe, wisely used the old concave-seated shoe as the least evil and last resort

Therefore, inexperienced men went to work to make frog pressure shoes. The object in their application was to lower the ground surface of the shoes to a level with the base of the frog, hoping that its pressure against the ground would so expand the wall as to permit the sole to yield under the pressure of the coffin bone upon its internal convex crown in violent action, not possessing sufficient anatomical knowledge to see that the frog is not in full contact with the wall, therefore cannot act as a wedge sufficient to force it apart. Secondly, the shoe being broader than the wall is thick, would not permit the frog to reach it, so there is an end to frog pressure with sunken shoes.

"Oh, but," its advocates say, "the frog presses the sole, and the sole the wall." Indeed; let us see if this is possible. The sole, bars, and wall are cut down in order to let the ground surface of the shoe down to a level with the base of the frog. So there is neither sole left to press against the wall, nor wall to be pressed by the sole, for both are cut away so low that a little more cutting would open into the sensitive parts of the foot.

So much for frog pressure by cutting down the parts. Another frog pressure scheme had been tried with tips, which consists in a shoe reaching from the toe to near the quarters. This proved no better than the former, for it elevated the toe, and permitted the heels to wear down. This shoe threw too much strain upon the tendons and ligaments, and again the concave seated shoe gained a victory.

In the near future, I propose to prove that nature has provided means for the expansion of the foot, independent of frog pressure. That the unshod foot expands independent of it; that the old method of nailing the foot to an unyielding shoe has been the cause of all the evils consequent upon shoeing in the past; and I also propose to furnish a shoe the application of which permits the full and free expansion of the foot when violently pressed, and its contraction as soon as relieved of such pressure, as readily as does the colt's unshod foot. It is now in use four months, and has cured every horse shod with it of contraction, corns, and other maladies, and it is impossible for any horse wearing it to become lame, except by accident.

JOHN N. NAVIN, V.S.,
Veterinary Editor of Indiana Farmer.

(*To be continued.*)

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ART. XVIII.—CHRONIC ENDOMETRITIS IN A MARE, WITH ENORMOUS DISTENTION OF THE UTERUS.

The history of this case dates back to February, 1875. Some time during that month the animal was obliged to wade through snow, while perspiring freely. That same evening she refused her food, and for several days following ate but little. The mare was not herself again until the following spring, when she was put to horse and turned out to grass.

Soon after this a discharge from the vagina was noticed, and being in heat she was again put to horse, which apparently arrested the discharge. Nothing further worthy of notice was observed for four years. In June, 1879, she was again put to horse, and twice during the month of August. After this she commenced discharging from the vagina a substance which was said to look like milk. The mare was treated for a while by the owner, as well as he knew how, but no improvement followed. In October, 1879, she was placed under the care of a would-be doctor, who diagnosticated leucorrhœa, and had the mare in charge until May, 1880, with no marked benefit.

In June, 1880, the mare was brought to me for examination and treatment, if any could be instituted with a prospect of improvement. Not able to make a thorough examination for the want of a proper speculum, I informed the owner to that effect, and was to call as soon as the proper instrument could be obtained. Messrs. Reynders & Co., of New York, enlarged one of Nott's three-bladed speculums, according to my directions, to meet the demand. July 28th, 1880, I made my first examination with the new instrument, and with it was enabled to see all that could be expected. At this time the mare was discharging from two to three quarts daily of thick yellowish purulent matter, having a very offensive odor.

By manipulation and a continued stream of warm water, I was able to dilate the os uteri. When the parts relaxed, the discharge became more profuse. After the discharge had somewhat abated, by the use of a lamp and reflector, I was enabled to see the whole of the vagina, and even into the uterine cavity. The floor of the vagina was considerably ulcerated. The os externum, and the portion of the uterine cavity brought into view, was also extensively ulcerated. I diagnosticated "chronic corporial endometritis," and gave an unfavorable prognosis.

Treatment, however, being desired by the owner, I ordered an alterative:

℞—Potass iodide, ʒi.
Pulv. hydrastes canad., ʒj.
Mix et ft. chart, No. 1; sig.; use as directed.

To this was added a good, nutritious diet. The vagina to be injected twice daily with warm water, and the following to be injected after each hot water bath:

℞—Glycerine, ℥iv.
Acid, tannic, ʒi.
Morphin. sulphatis, gr. ij.
Mix; sig., inject.

At other times I tried the following:

℞—Fld. ext. hydrastis, ℥i.
Aqua grad., ℥xvi.
Mix; sig., inject.

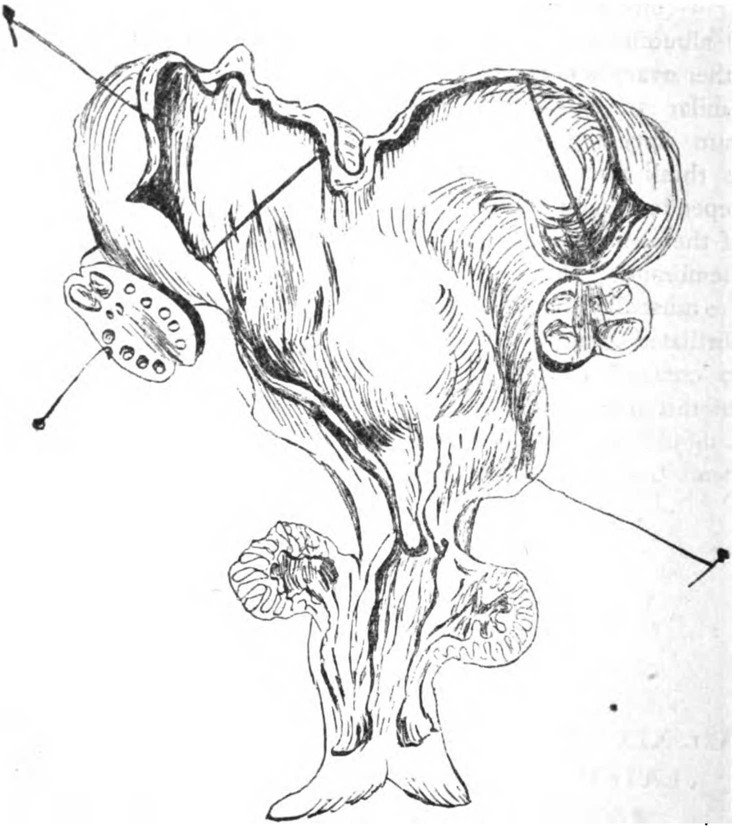
To the ulcers that could be reached I applied, three times a week, a solution of nitrate of silver, gr. xxx., to aqua ℥ i.

Under this treatment the mare rapidly improved, and by October all discharge ceased. The mare was in good flesh, in fact quite fat. A tonic treatment, however, was continued. Medicated injections were discontinued, but the tepid vaginal baths continued. The mare continued quite well for some time, until the owner, thinking her recovery complete, without consulting me, drove her. Two weeks after driving, the vaginal discharge returned. The weather now being cold, the mare came down with a rheumatic attack. Vaginal and uterine treatment were not again instituted. From this time on the mare continued to lose flesh and strength until July, 1881, when I ordered her killed. At the necropsy nothing specially abnormal was noticed, except in the genito-urinary tract. The uterus contained about five gallons of very offensive pus, such as is occasionally found in the guttural pouches very inspissated and curdled slightly.

The genito-urinary organs were sent to the School of Histology in connection with the Columbia Veterinary College, where they were examined by Prof. Porter, and the following report rendered:

"The uterus was found greatly enlarged, the two cornua branching off from the body like two sacs. The ovaries were also enlarged. The os uteri was firmly closed, and it was with considerable difficulty that a probe could be passed either from the vagina into the uterus, or vice versa. The point of constriction appeared to be at the os internum. The uterus measured about thirty inches from os to fundus, and thirty-six inches from cornua to cornua. The uterus easily held two hundred ounces of water. The uterine walls were considerably thickened. The mucous membrane appeared to be completely destroyed, leaving the muscular tissue bare, or covered only by granulation tissue. Microscopically, the increased thickness of the uterine wall was found to be due, in great part, to an increase in the intermuscular fibrillated connective tissue, the muscular tissue showed very little, if any, increase in its elements;

they appeared rather to be atrophied. This fact, I think, would explain the enormous dilatation which had taken place. The whole substance of the mucous membrane was found nearly



destroyed, bearing little else than fibrous and muscular elements for the lining wall. This condition of the uterine substance differs somewhat from that found in the human subject where the uterus has been affected with "chronic corporeal endometritis," principally, however, in degree. It is rare, if ever, that the human uterus is extensively dilated, and probably there is never such a complete destruction of the uterine mucous membrane.

Both ovaries were the seat of extensive cystic degeneration. In one there was very little left of the normal ovarine tissue, it having been replaced by these large cysts, filled with a clear, straw-colored serous fluid, which contained a large quantity of albuminous substance, similar to those just described; the other ovary was the seat of two large and several smaller cysts similar to those just described. The vagina and os externum appeared to be nearly normal. I should be inclined to think that the persistence of the disease in this case was dependent upon these causes: First, the contraction or stricture of the os internum. Second, the almost total loss of the mucous membrane. Third, and principally, the atrophied condition of the muscular coat, with the great development of intermuscular fibrillated connective tissue, which probably left the uterus unable to contract or undergo an involution. The case is of great interest in veterinary medicine, and also in comparative pathology. I should be inclined to regard the case as unique, and am not aware that one like it has been recorded before."

L. E. WHEAT, V.S.,
Scranton, Pennsylvania, and
W. H. PORTER, M.D.,
New York.

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ART. XIX.—PACHY-MENINGITIS INTERNA.—RETICULATED ROUND CELL SARCONIA OF DURA-MATER AND EXOSTOSIS OF THE INNER TABLE OF THE SKULL.

On August 17, 1881, I was called about forty miles from my place of business to see the horse from which I obtained the following history. The animal was a bay gelding between fifteen and sixteen hands high, aged about fifteen years; it was in fine condition, and weighed between eleven and twelve hundred pounds. The horse had previously worked on a fire steame outlived two mates. About three years ago the present owner bought him from a regular horse-dealer to work on his farm, and the horse proved to be a true, faithful and useful worker. Last fall the animal had an attack of nasal catarrh, and was treated for the same by a veterinary surgeon. Since then there has been a bulging outward over the frontal sinuses. After the above attack, the owner informed me that the animal "had never been like himself."

During the last two weeks of his life he became very lazy, and seemed not to care which way or how he went. One evening the owner turned him out to pick some grass and he ran away, but came back home again in the morning. At another time he deliberately went over a stone wall, apparently without any knowledge of the wall being in his way.

When I first saw the animal the symptoms were as follows: The horse was very uneasy and kept continually walking around the stable. Every few minutes he would press the anterior portion of the neck on the left side against the partition, often so hard, at the same time turning his body so far to the right, that he nearly strangled himself. The temperature was only a trifle above the normal; pulse from 44 to 48; respiration did not seem to be disturbed. He ate but little. Food was often taken into the mouth and held for some time, when he would get a portion well back into the mouth and commence grinding, but swallowed very little, if any. When given a pail of water to drink from, he would plunge his nose well into the pail and blow the water all around, but drank scarcely any. The day on which he died, however, he drank a whole pail of water, and succeeded in eating and swallowing a few corn leaves and a half dozen pears. Five hours before death he became wild and frantic, breaking everything that came in his wav, and it was with difficulty that he could be kept walled in. About one hour before death, however, he dropped down and lay quiet, but snored heavily until death, which occurred without a struggle.

Before I saw the animal the parties had been administering bromide of potassium. I ordered a fluid diet, with a little fresh grass; also,

℞—Pulv. aloes, barb., ʒ x.
Hydrag. chloridi, mite, gr. xx.
Misce; et fiat in bolus.
Sig.; to be administered as soon as procured.

The bromide salt was continued in one and two-drachm doses, also enemas. On Saturday previous to his death, the bromide salt was discontinued, and chloral hydrate, in half-ounce doses, three times a day, substituted, also:

℞—Pulv. aloes, Barb., ʒ iij.
Pulv. zingiber, rad., q. s., ad.
Misce; et fiat in bolus.
Sig.; p. r. n.

Tinctura aconitii, in minute doses, was given every two hours.

During the evening he became wild, and I injected morphine hypodermically whenever an opportunity offered. All treatment, however, availed nothing, and the unfortunate animal died at 10 o'clock A. M., August 21st, 1881.

A necropsy was made ten hours after death. The brain weighed twenty-four ounces. There was a large depression upon the upper surface of the anterior lobe of the left hemisphere. Directly over this depression, between the dura and pia mater, there was a deep layer of thick, yellowish, semi-fluid matter. The accumulation had pressed the pia away from the dura mater. There was a bone-like tumor growing from the internal table of the cranium. This bony outgrowth was so situated that it pressed into the side of the cerebellum of the left side. The vessels of the membranes were distended with blood. The frontal sinuses were filled with a fatty gelatinous looking substance (fibrin). The lateral sinuses were also partially filled with a similar looking substance, but a little more flaky in character. The walls of the sinuses were somewhat thickened. Growing from the inner surface of the dura-mater there was a small neoplasm, about three-quarters of an inch in diameter.

The brain, the portion of dura-mater to which the tumor was attached, and a portion of the exostosis, was sent to the School of Histology in connection with the Columbia Veterinary College, for examination. The following report was rendered by Dr. Porter:

"The brain substance proper appeared to be normal. The depressions on the surface, which were so marked at the necropsy, were not as perceptible when received. The portion of the bony outgrowth was found to be true bone, and undoubtedly an exostosis. When a transverse section of the tumor was made, the central portion was much lighter in color than the outer part.

"*Microscopical examination of tumor:*—The general structure was a reticulated network, containing large and small round connective tissue corpuscles. The cells were surrounded by a delicate intercellular substance. Portions of the growth were also very vascular, and filled with thin walled capillaries, which were distended with blood corpuscles."

GEO. M. PARKINSON, D.V.S.

MIDDLETOWN, Conn.

EDITORIAL DEPARTMENT.

BOGUS VETERINARY MEDICAL DEGREES.

IN all the discussion over bogus medical diplomas which has been going on during the past year nothing has been said about bogus veterinary degrees. Yet from information kindly furnished us by Prof. E. S. Bates, Dean of the Columbia Veterinary College and School of Comparative Medicine, we infer that considerable business in this direction has been done somewhere in this country.

Immediately after the organization of the College aforesaid, some four or five years ago, requests for the price of a diploma began to come in. For two or three years letters offering various sums for the privilege of a veterinary degree were received, at the rate of one or two a month. Of late, we are told, this department of correspondence is less active. The letters in question came from every quarter, including England and India. The majority, however, came from the West. The price offered varied from a shake of the hand to five hundred dollars.

We print, in part, one characteristic letter from a Western man who "meant business":

"Desire a diploma, but cannot spend time necessary to get one. Will give just one hundred and fifty dollars for the same—if we can deal; if not, all right. Anything you may say upon the subject will be strictly between us.

"Sincerely, etc.

"P. S.—You need not take the trouble to send me a lecture upon the immorality of my proposition; it would be wasted Am a Western man, and will do just as I agree, quietly, as it will be of service to me and cost you nothing."

Another letter, a portion of which we print *verbatim*, has some striking literary merits. There is a pleasing candor, also, about the writer's proposition which goes to make us wish he had succeeded better in his request:

"DER SIR.— * * * * I want you to do me a faver if you Can posable & I will Reward you Sure when I Come to the College I have Study vet Book for A long time & done good deal of doctern & had good Results in all my practis But when I go to Collect my Bills grate meny of our people will Say you haven not got no diaploma & I wont pay you tel you git one So if you Can assit eny way pleas do it if you Can send me A diaploma by express Cod then I Can Collect wat is due to me & will Beable to Come to See you and give you a harty Shake hands I am poore & ned assistence I am young only 28 year old if this wont do Could I be examin by letter & git one pleas give me the best information you Can in Regard to it pleas answer Soon I want to do all I Can So I Can Come out to new york nex fall I think I Can bring one or to more Students when I Come.

"Yours truly."

With such a demand for veterinary degrees, it seems hardly possible to believe that there is not some institution which supplies them. Of this, however, we have no certain knowledge. The notorious Buchanan had no veterinary department in his University, which shows some lack of enterprise and knowledge on the part of that eminent man.

It is very well known that there is a veterinary society in this county which disposes of licenses or diplomas at rates which amply compensate those engaged in the business. No society, however, can give a degree, and a license only entitles a man to use the letters V. S.

It seems to have been through a great oversight that one of the two American Veterinary Colleges gives to its alumni only the title "Veterinary Surgeon." Its degree is really, therefore, only a license, and its alumni are likely to be confounded with those who assume the letters V. S., or with those who have bought it from a chartered veterinary society. It should in justice to its graduates, as well as for the better standing of the profession, give a regular doctorate. We should be glad to see the change made in response to our suggestion. At present the Columbia Veterinary College is the only institution in the United States which gives the degree of Doctor of Veterinary Science.

NEW VETERINARY COLLEGES.—We are glad to learn that more veterinary colleges are to be organized in the country. At St. Louis and Philadelphia, efforts are making to establish such institutions, and there seems to be a fair prospect of success. We have now in the United States only two veterinary colleges, both located in this city. Many persons who would like to study veterinary medicine live, perhaps, too far away to do so. On the other hand, a great many persons who have the taste and capacity to make good veterinarians, do not commence the study because its advantages have never been adequately presented.

As a result, the country is flooded with ignorant quacks, a lively and typical picture of whose performances was given by Dr. Navin in our last issue. The two colleges in this city are supplying annually only thirty or forty educated veterinarians.

We believe that there should be more colleges, therefore. We can hardly go so far as Commissioner Loring, who has said that our country needed fifty; but it will be many years before we can fear the establishment of too many.

We must give a word of caution, however, to those who undertake to start a new college. The public still needs to be told that education is essential to a veterinarian. Newly organized institutions will have to work for their patronage. Money will be needed, and a few years must pass before any success can be attained.

Attempts to found veterinary colleges elsewhere than in New York have heretofore been failures. Still, veterinarians are really needed, and so success will surely follow in time intelligent and energetic effort. And we can endorse the belief expressed in the *St. Louis Sportsman*, "that sons of wealthy farmers and storekeepers, in the provinces, will come in numbers to such a college, and the whole district round the home of each graduate will benefit by its institution." It should be borne in mind also that veterinary colleges are very greatly self-supporting, as a charge is made on all animals treated at the hospital.

THE TREASURY CATTLE COMMISSION.—The Secretary of the Treasury has appointed a commission to investigate the subject of contagious diseases among the cattle of this country. The commission consists of Prof. James Law, of Cornell; Mr. J. H. Sanders, editor of the *National Live Stock Journal*, and Dr. E. F. Thayer, of West Newton, Mass. These are all most competent men, and their selection is creditable to the good judgment of the Secretary.

The commission met first at Saratoga, and there organized, Prof. Law being made chairman, and Mr. Sanders secretary.

The session was also devoted to laying out the work before them. This will consist in preparing quaratine regulations for cattle imported from Europe; in preparing regulations for the disinfection of cars to be used in the export cattle traffic, and in devising means for definitely ascertaining the extent of the infected districts in the United States. The unwarranted discrimination on the part of the Canadian Government against American cattle was also considered, and Dr. Thayer's report upon the contagious cattle disease prevailing in Nova Scotia was read.

A subsequent meeting was held on August 31st. It was here announced, as the result of previous investigations, that decided pleuro-pneumonia existed in Kings, Queens, Westchester, Putnam, and Richmond counties, New York. The disease had also been found in New Jersey, Pennsylvania, Maryland, Virginia and Delaware; but none west of the Alleghanies.

The commission has also issued a circular, addressed to the Governors of States and Territories west of the Alleghanies, warning of the danger of buying calves or stock east and bringing them west.

Further important work may be expected of the able gentlemen composing the commission in question.

THE APPEARANCE OF UNKNOWN DISEASES.—It cannot fail to strike a careful reader of the newspapers, that there is a very large number of very strange diseases constantly appearing among the cattle or horses in different parts of the country. In the past few months we have noticed announcements of such troubles in a half a dozen different quarters. There has been a "mysterious disease" attacking the cattle or horses in New Jersey, New York, Nova Scotia, Illinois, Colorado, Nebraska, Oregon and other places. The story is almost a stereotyped one: "Veterinarians are unable to give a name to it." These facts do not speak well for the local veterinarians, since in most cases the disease is not so mysterious after all. It is generally some form of anthrax, or perhaps some bowel or lung complaint, or an influenza.

We beg our veterinary readers hereafter to furnish a diagnosis, of some kind at least, to the associated press. It does not look well to have it go abroad that our cattle are subject to four or five new kinds of diseases every year.

We should be very glad to receive accounts of outbreaks of these pathological mysteries from the local veterinarians, whenever such occur.

PET ANIMALS AND CONTAGIOUS DISEASES.—The fact that pet animals can carry contagion, and thus be the means of spreading fatal diseases, is not widely known nor duly appreciated. We have heard of authentic cases in which scarlet fever was communicated from one person to another by means of a cat. Dr. Hewitt, of Lake Superior, relates a somewhat similar instance in which diphtheria was communicated by the same animal. He had noticed for several days that his pet cat was suffering from an enlargement of the glands of the neck; he also remarked the same in other cats. His cat found a resting place in the wall behind the stove, and there died. The day the animal was removed, diphtheria, in its most violent form, broke out in his family, resulting in the death of two or three of his children, and the doctor himself barely escaping with his life. Up to this time the community was remarkably free from sickness of any kind. It was the start of a severe epidemic.

We refer to this subject in hopes that more facts bearing upon it may be communicated by our readers. These are at present scarce, but a little attention paid to the matter would no doubt secure much that would be of importance to comparative and to preventive medicine.

WHAT PROFESSION SHALL A YOUNG MAN CHOOSE?—We call the attention of our readers to the exceedingly able address of Professor Bates, printed in another part of this JOURNAL. It contains the first complete and authentic history of veterinary education in this country that has ever been written. More than that, it presents in a most effective way the facts regarding the needs and the purposes of American veterinary medicine.

It is not necessary to repeat here the statements made and the statistics given by Dr. Bates. They all show the necessity to our country of more veterinarians, and the sure promise of success to those who faithfully undertake the practice of comparative medicine.

We are pleased to have received from our esteemed correspondent, Dr. John Navin, some words upon this subject. Dr. Navin's ripe experience and sound judgment well qualify him to say what veterinary medicine needs and what it promises to those who educate themselves in it. The veterinary profession is the only one that is not overcrowded, while paying well in money, dignity, and honor. These are the sentiments of our Western Nestor, and they are what every one who is acquainted with the facts must echo.

ENSILAGE AND DISEASE AGAIN.—Taking up the suggestion made by us in a previous editorial, that the much-discussed ensilage may cause disease, a writer in the *National Live Stock Journal* makes several points that deserves attention.

In the first place, ensilage is a wet food, containing just about as much water (75 per cent.) as grass. It is a question whether such succulent food is good for animals in the close confinement of winter. Again, there is a danger that the ensilage may preserve anthrax germs.

There may also be various noxious plants packed away with the corn stalks. If so, the conditions of the silo are such as would bring out all their poisonous properties. The dangers from excessive fermentation, and the effect of the new diet upon the fertility of the animal are also to be considered.

Altogether, it is more than ever apparent that the silo is a thing to be watched by the veterinarian.

HYDROPHOBIA AMONG THE DOGS IN NEW YORK.—For the first time since the establishment of the dog pound in this city, a case of hydrophobia has been found. It occurred in a half-Spitz dog, which was found on the streets, September 22d. The case was diagnosed at once by Dr. Ennery, veterinary surgeon. As stated by him, the dog showed very marked evidences of the disease. The animal was put in the dog cart, where he crept about slowly on his belly. The moment his nose touched anything, he would give a convulsive snap. He was evidently stone blind, and his eyes were deeply congested. The other dogs, as is usually the case, seemed afraid of him, and tried to keep out of his way, but he bit many of them before reaching the pound. The diseased animal was shot at once, and those bitten were drowned.

There is a prevalent error regarding the frequency of hydrophobia. This is the first case that has been found among forty-seven thousand dogs that have been drowned at the dog pound in the past five years.

THE QUESTION WHETHER WE SHALL HAVE A NATIONAL CATTLE COMMISSION in this country was warmly discussed at a meeting of the Farmers' Club, in this city, last month. Prof. Heath, the president, introduced some resolutions urging the necessity of such a commission. These resolutions were carried by a large majority. There is no doubt that it would be a great benefit to farmers, as well as to owners of live stock, if there were some central body which would keep the country informed regarding contagious diseases among our domestic animals. Exactly how such a body should be constituted remains still to be seen. We have before expressed the opinion that a national commission under the direction of the Agricultural Department would answer the purpose. It would be practically a bureau of that department.

VACCINATING ANIMALS.—Every veterinarian should make himself acquainted with the experiments and alleged discoveries of Pasteur regarding animal vaccination. We present an account of them elsewhere, in the Department of Progress of Veterinary Science. Prof. Pasteur claims to have discovered a method by which the virus of contagious diseases can be modified so as to secure to the animal immunity against disease. He professes to have done for some, if not all, of the contagious diseases of animals what Jenner did for small-pox. His claim is well substantiated in some directions, but it needs further proof and practical trial. Let us have some contributions from American veterinarians on this subject.

THE VETERINARY MEDICAL REGISTER, which we published in our last number has been received with much favor. It has, we believe, done a great deal to make veterinarians known to each other, and has tended to stimulate the cause of veterinary education. We have in hand a considerable number of additional names. It seems better, however, to wait until the next issue before publishing them. By that time we shall doubtless be able to make our list very complete. We again urge all veterinarians whose names are not recorded to forward the ma tonce.

REVIEWS.

A Treatise on the Diseases of the Ox; being a Manual of Bovine Pathology; especially adapted for the use of Veterinary Practitioners and Students. By John Henry Steel, M.R.C.S., F.Z.V.S. New York: John Wiley & Son, 13 Astor Place. 1881.

The above is the title of a most valuable contribution to bovine diseases. This branch of veterinary literature has long needed a scientific, comprehensive, and reliable treatise on the nature, pathology, surgery, and treatment of the accidents and diseases of cattle. The volume before us, of about 300 hundred pages, well and judiciously written and arranged, comes to us, therefore, in an opportune time, as the practitioners and students of this branch of comparative medicine require just what this book offers.

The introduction begins appropriately with a definition of disease and a discussion of its causes. The author then details the methods of diagnosis; and urges the necessity of obtaining a full history of the causes. In the latter chapters, medicinal agents receive full consideration. Bovine surgery is also treated of. The anatomy of the ox is briefly given.

The volume is profusely illustrated with wood-cuts, and clearly and concisely written. The arrangement of the subjects discussed is judicious; commencing with diseases of the blood, and continuing with the disease ot the different systems of the body.

On the subject of contagious diseases of cattle, and the sanitary measures required for the prevention of their spread, and in the views expressed regarding the value of *inoculation* and *vaccination*, the author has shown a wide knowledge and excellent judgment.

Steel's "Diseases of the Ox" is a book indispensable to the veterinary practitioner.

A. S. H.

The Cat: An Introduction to the Study of Backboned Animals, especially mammals. By St. George Mivart, Ph.D., F.R.S. With 200 illustrations. New York: Charles Scribner's Sons. 1881.

The book before us contains a most complete account of the anatomy and physiology of the cat. But there is in it much more than this. The author gives briefly, but clearly, the fundamental principles of physiology in general. He also gives much of value to the student of comparative anatomy. We commend the work to persons who wish to study physiology, and to all those who are interested in natural history or comparative anatomy. It is a book that ought to interest, and cannot but instruct veterinarians.

NARVIN'S VETERINARY PRACTICE, OR EXPLANATORY STOCK DOCTOR. Copiously illustrated by cuts and engravings. By JOHN NICHOLSON NARVIN, V.S. Indianapolis: John B. Hann. 1880. 8vo., pp. 730.

The work is divided into two sections; the first devoted exclusively to the horse, the second to cattle, sheep, swine and poultry. The first part is divided into four divisions; the first treating of the diseases of the horse; the second to a brief history of the horse—breeding, training, stables, feeding, etc.; the third to the anatomy and age; the fourth to general remedies. The book is written in common terms, especially for the laity, by whom it will be readily understood. Although not pretending to be a classical and strictly scientific work, it is full of good common sense, and shows the great and varied experience of its author. It unquestionably will be of great service in the field for which it is designed.

There is no mysticism, charlatancy or clap-trap about it, but plain facts are related in a clear and intelligent manner. It is a work which will be of no little help to veterinarians, as well as to those not specially trained in veterinary practice. It is the best work that has yet been written by an American author.

W. H. P.

THE MANAGEMENT AND DISEASES OF THE DOG. By JOHN WOODROFFE HILL, F.R.C.V S. With Thirty-nine Illustrations. New York: William R. Jenkins. 1881. Pp. 383.

The author, in his preface, speaks very truly regarding the little attention that has been paid to the diseases of the dog. Man's best animal friend has been, and still is for the most part, at the mercy of ignorant quacks. Mr. Hill has done a good service in presenting compactly and clearly what is known about the dog's diseases. The treatise is not an exhaustive one and does not pretend to go very deeply into pathological matters. We might, indeed, criticize it on this account, but it is to be remembered that there is as yet no audience for any profoundly scientific treatise on canine diseases.

The book presents the latest and probably the best account of the subject chosen which is to be found in the English language.

CASE DEPARTMENT.

I.—A CASE OF RABIES.

REPORTED BY WILLIAM HENRY PORTER, M.D., V.S.

A dog named Mina, and owned by Mr. Walter H. Beebe, of New York City, was a valuable English setter, aged four years and three months. This animal was bitten by a common cur, which was supposed to be mad, on June 30th, 1881, at Morris Plains, New Jersey. Bluebelle, another fine bitch, also owned by Mr. B., was bitten the same evening. It is an open question as to which dog was first attacked, but both of them were severely bitten many times, about the mouth and shoulders; Mina, in one place, quite through the upper lip. After this the cur disappeared, and what became of him was never positively known. Bluebelle was expected to have whelped the following day, but this she failed to do, and has not since.

July 5th Mr. B. saw both dogs, and found them in fine condition, the injuries giving no trouble, and his impression was that the wounds were quite healed, and they appeared to be feeling perfectly well; Mina quiet, and not especially excitable. They remained well, and the wounds gave no trouble until July 18th, when Mina refused to eat, and continued to fast up to July 21st, when the owner was first notified of the fact.

Mr. B. talked of bringing the animal to the Columbia Veterinary College Hospital for treatment, and in case of death, for the benefit to science from an early necropsy in a well-watched case.

On Saturday, July 23d, the owner went to Morris Plains, with the above stated purpose in view, his keeper, Mr. Parrol, having thought the dog too excitable to handle alone. When Mr. B. arrived at the farm, however, the dog seemed quite manageable, and anything but mad, and jumped up to meet him as usual. The wounds about the mouth and chest were not extensively inflamed, but the lips and tongue were swollen, the latter being very red, and covered with a thick coating; the margins of the tongue, however, were quite red, but free from sordies. The dog had often been boxed for transportation, but never muzzled, to his knowledge. Just before attempting to muzzle her, she had a severe attack of dry retching, but without expelling anything from the mouth. The attack finally terminated in a convulsive cough, after which the coating on the tongue was less marked. After this a muzzle was carefully slipped over the nose and fastened, an operation which she bore quite well; but when about to be put into the box the muzzle seemed to come in contact with the inflamed lips, which almost immediately threw her into a frenzy, which was frightful to behold. She was, however, got into the box, which was bound together with strong cord, to prevent any possibility of her breaking out. During this frenzy her mouth became badly cut from biting at the wire muzzle, and both blood and froth, probably saliva, flew in all directions from her mouth, and in considerable quantities. After about ten minutes of this violent struggling she became, apparently, exhausted, a condition which was thought in part, however, to be due to the safety cord about her neck, that partially strangled her. She fell down in the box, and after a few gasps was dead, her teeth firmly clasping a part of the muzzle.

It might be well to mention, in connection with the above history, that Mina was removed from her kennel among some other dogs, and placed alone in a part of the barn where there was no floor. Some straw, however, was furnished her as a bed, but she refused to lie upon it, preferring to lie upon the damp earth.

Unfortunately, was unable to make the necropsy until forty-eight hours after death. Immediately after death the dog was boxed and buried in a damp, shady place on the farm, and not exhumed until the time of the necropsy. The animal was well supplied with adipose tissue. There was only a slight amount of decomposition at this time. The lips and cheeks were very much swollen, and the surrounding areolar tissue filled with bloody serum. The whole neck, in fact, was swollen, and infiltrated in the same way.

Thoracic Cavity.—The pericardium contained a small amount of bloody serum. The right cavities were distended with blood and coagulum; the left cavities nearly empty. Microscopically the heart fibres were found to be normal. The lungs were very deeply congested, very dark red in color, but otherwise they appeared normal.

Abdominal Cavity.—The portal vein, its branches, and their tributaries were distended with blood. The spleen appeared normal. The kidneys were deeply congested, and microscopically the epithelium was very granular, but this may have been in part due to the time which had elapsed between death and the necropsy. The liver was deeply congested; in fact all the internal organs were intensely congested. The cranial cavity and spinal canal were laid open. The meninges of the brain and cord were not congested, but, on the contrary, anæmic. The brain substance also was very pale. The brain was found too soft to remove with any prospect of preserving. The upper portion of the spinal cord was carefully removed, but it was impossible to harden it sufficiently to make any satisfactory section, therefrom.

The question as to the case being one of rabies is somewhat doubtful. But from the fact that the dog apparently died from asphyxia—which is considered as the immediate cause of death in rabies—I think even in absence of any further positive proof the case should be regarded as one of rabies, and the other dog bitten closely watched for six months at least.

This case, I think, will be of interest in connection with the pathology of rabies and hydrophobia, copied from Dr. T. E. Satterthwaite's article on the same.

We insert the following in connection with Dr. Porter's case. It represents the latest facts known regarding the subject, and will be found of much interest.—Ed.

PATHOLOGICAL ANATOMY OF RABIES, BY DR. T. E. SATTERTHWAITE, IN SUPPLEMENT TO "ZIEMSEUS' CYCLOPEDIA OF THE PRACTICE OF MEDICINE."

Dr. R. W. Gowers has devoted careful attention to this subject, and while he disclaims having noticed any pathological changes that are distinctive of the disease, he has found a certain degree of uniformity in them. In the gray matter of the medulla and cord he observed great distention of the vessels. This condition was regarded as pathological, even after taking into consideration that death in hydrophobia is from asphyxia. The vascular distention was most abundant about the ganglionic bodies which lie beneath the floor of the fourth ventricle—a condition which is regarded by Dr. A. W. Foote as explaining the frequency of glycosuria in hydrophobia. In the region of the nuclei of the glossopharyngeal, and hypoglossal and pueumogastric nerves, the perivascular sheaths were most markedly engorged with blood. The greatest intensity of the pathological change coincides with the area that has been termed the respiratory centre. Dr. Gowers, however, had seen similar collections in chorea in a dog. He lays weight, however, upon the site of these changes in hydrophobia.

Though peculiar changes have been described in the follicular glands, tonsils, and remaining parts of the throat, Fahrer asserts that in some well-marked cases these have been absent.

Bollinger, however, gives a case which came under his observation at the Munich Hospital, in October, 1875. There was moderate reddening of the pharynx, with ecchymosis in the vocal cords; the lungs also were full of blood, the right lower lobe being in a state of splenization, and there was croupous bronchitis. Both of these latter lesions, however, were caused by the entrance of foreign bodies into the lungs—in this case milk and chloral —which accidentally deviated from its proper course while the patient was being artificially nourished.

Allbutt and Coates, according to Fahrer, describe changes in the nerve-cells and vessels, deposits of round corpuscles in the perivascular spaces, also granular degeneration, and even embolism, mostly about the respiratory centre.

Hammond has detailed the history of a case which he saw in June of 1874. The pathological appearances which were described in this case, and which concerned the nervous system, were briefly as follows:

In the cortical substance of the brain, an increase in size and number of the blood-vessels, with minute extravasations of blood. The first and second layers of cells had been replaced in large part by fatty matter. Between the two layers were anyloid corpuscles. The third layer was but little changed, and the others appeared not to have been involved. In the pons varolii, enlargement and thickening of vessels and extravasations were also seen. In sections made through the medulla, so as to include the nuclei of the hypoglossal and pneumogastric, there were also numerous extravasations.

Benedick also has lately described peculiar inflammatory changes in the brain of rabid dogs, and in the case of a man. The morbid appearances are classed as granular degeneration, miliary abscesses and hemorrhages.

N. Kalısvukoff has further described similar appearances, but neither of these alleged findings could be sustained by Dr. Augustus Forel. His studies, conducted by excellent methods, and as yet unpublished, were made upon the brain of a hydrophobic man and several rabid animals (*Bollinger*).

On the other hand, Drs. R. H. Fitz and Shattuck, of Boston, in concluding their history of a case which had been under most excellent observers, and where the post-mortem and subsequently the microscopic examinations were conducted with unusal care, make the following statement:

"In brief, then, the alterations were a diffuse cellular infiltration of the adventitia of the veins, venous injection and thrombosis, perivenous hemorrhages and miliary abscesses." The "hyaloid masses," which have been described, are, they state, very often met with in healthy brains and cords hardened in chromic acid and its compounds, and are, probably, the results of decomposition, independent of any pathological changes.

II.—THE EPIZOOTY AT SAN FRANCISCO—ITS TREATMENT, AND A THEORY OF ITS PATHOLOGY.

Editor of Journal of Comparative Medicine:

One of the greatest difficulties with which the practitioner of veterinary medicine has to contend, is the treatment of that class of diseases termed epizootic. In no other class of cases is the superiority of the well-educated veterinary surgeon over the empiric better exemplified than in the manner in which this description of malady is treated by each. Here the skill of the empiric generally falls far short of the great expectations that have been raised by his extensive experience and long catalogue of former cures. For, unfortunately for his reputation, and the pockets of those proprietors of animals requiring his aid, the disease, although so extensive in its character, so rapid in its course, and so fatal in its termination, is yet generally so transitory in its sojourn, that he cannot profit by that experience which is the only thing to guide him in the practice of his art. It is generally when the disease has almost entirely disappeared, when such knowledge is no longer of any practical utility, that he commences to understand anything about its peculiarities. Dearly bought is such experience; for perhaps, by the exhibition of improper remedies, he has been the cause of death to the majority of his patients, when in many cases, were nature left to herself, her powers would have triumphed, and the animals recovered.

There has been a disease prevalent for some months past among the horses of this country, and there has been a number of fatal cases, due largely, I think, to an injudicious mode of treatment, resulting from ignorance of the true pathology of the affection. A thorough knowledge of epizootic diseases is one of the most important parts of veterinary education, for they are diseases which will occasionally destroy, in a short time, great numbers of useful animals; their causes are obscure or concealed, their march insidious and rapid.

Epizootic diseases are ordinarily transmitted with extreme facility from one individual to another; they generally present themselves under the same aspect, following one analogous march, offering occasionally anomalies, the just value of which are not appreciated, or which are uselessly magnified into particular species.

It seems to be a law in the animal economy that the action of an organ or set of organs cannot be increased without that of others being proportionately diminished. This law appears to extend even to the nervous system. For example,there may be an increased action going on in the organic nerves or system of the sympathetic, with which the mucous membranes are so plentifully supplied. There is then present, as a consequence, a proportionate degree of debility in the motor system, producing that-intense prostration of strength always observed in extensive epidemic affections of the mucous membranes. The contrary effect may be observed to take place when there is a morbid increase of action in the motor system, or those nerves supplying the muscles of volition. Tetanus offers a most striking and familiar example of this. Here there is an increase of irritability of the spinal cord, so that all the muscles of volition are thrown into intense activity. The organic system then becomes greatly debilitated, loses in a measure its influence, and as a result there is such a torpid state of the digestive organs, that in many cases the most drastic medicines fail to produce the slightest effect on the intestinal mucous membrane.

These facts throw considerable light on the kind of treatment required to be employed in the present "epizootic" among horses. It is evidently a constitutional affection, exerting its influence principally on the organic system of nerves, through the medium of which it affects the mucous and tegumental membranes generally, more particularly those that have been already rendered peculiarly predisposed by chronic disease or some peculiar idiosyncracy of the individual. In confirmation of this assertion, it may be adduced that when there is a disposition to ophthalmia, the affection of the eyes is sure to be more intense, particularly in the one before affected; and where there is a tendency to diarrhœa, the mucous membrane of the intestines suffers more than any other part of the animal; also, that in cases of chronic bronchial irritation the respiratory system suffers much more considerably than under any other circumstances. We must entirely discard the idea of its being merely a simple inflammatory affection of one or more of the mucous membranes, with fever occasionally as an accidental attendant. The results of treatment suggested by such an idea have proved its erroneousness beyond a doubt. By bleeding, you only diminish the already far too weakened forces of the animal, without at all striking at the root of the evil. Give the ordinary dose of aloes, and you produce super-purgation. The bronchial membrane also sympathizes, and you thus establish what is a thousand-fold more difficult to contend with than the original disease, which will, like all epizootical diseases when once set in, run its prescribed course.

In treatment some agent is required, the action of which will have the effect of allaying the increased irritability of the organic system, and thus, by striking at the fountain-head of diseased action, remove those derangements of function which, although properly speaking are merely secondary effects, are by many considered as the primary element of the disease. For this purpose I have had recourse, and with the happiest effects, to the potassio-tartrate of antimony, a medicine which possesses the valuable qualities of acting on the mucous tissues, not alone by mere contact, but more particularly through the medium of the nerves by becoming absorbed into the system and thus acting on their centres. It also has the effect of allaying increased arterial action. When given repeatedly it acts as an aperient, and where the bronchial mucous membrane is threatened or has already become implicated, there is no remedy better calculated to avert the danger. In some cases I have combined this medicine, and I have thought advantageously, with a little of the nitrate of potass—the dose of the tartrate, three and a half drachms, and that of the nitrate, two drachms—given morning and evening dissolved in a little water. By giving them in water their action is almost immediate, and the effect is better than when given in balls. The tartarized antimony, when given in its solid state, is very liable to irritate the stomach, and in man causes vomiting. The horse is, however, a most admirable subject for the exhibition of such an agent, he being an animal to whom the power of vomiting is denied. Nausea can, therefore, in his case be carried almost to any extent. When an animal is first observed to be affected with the "epizootic," it is desirable to place him in a large box-stall, allowing him to have as much air as possible, both throughout the day and during the night. Of air, no matter how cool the temperature, he cannot possibly have too much. This is an axiom that should never be forgotten by the veterinary practitioner. The animal should, however, be well clothed and the legs bandaged, but not too tightly, with flannel. Such means have a tendency to equalize the circulation, particularly where there is diminution of heat. Let one of the principal objects be to allow the patient to respire plenty of pure air, at the same time keeping the surface of the body moderately warm, if the season be at all inclement.

I am well aware that there are a number of veterinary practitioners, and some having pretensions to eminence, whose treatment consists in copious bleeding, blistering the throat and sides, and then turning their patients into a field or paddock, regardless of the weather, there to live or die as chance may decree. To any person of common sense, at all acquainted with medical matters, such a mode of treatment must appear in its true light—a lamentable example of the bigoted ignorance which still remains among many members of the veterinary profession.

W. H. CARPENTER, V.S.

966 HOWARD ST., San Francisco, Cal.

III.—SPINAL PARALYSIS IN THE HYENA AND PUMA.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

At the St. Louis Zoological Garden (Department of the St. Louis Fair Association) there have been several cases, among the Carnivora, of paralysis, dependent upon spinal lesions.

An adult spotted hyena for a number of months, without known cause, had manifested a weakness in the hind parts, as shown by a more or less noticeable "wobbling" of the hind legs in turning. This symptom was followed by decided paralysis, the animal not being able to stand. There were no other symptoms. Upon treatment with strych. sulph., this condition improved and the beast seemed on the road to recovery, though a return to complete health did not seem probable. While passing through a doorway she struck her back, or rather scraped it lightly, and instantly collapsed, falling as though struck down. From this time on the paralysis persisted—her condition gradually weakening. A benevolent individual kindly suggested to blister the back, but did not accept the invitation to walk in and apply his remedy. All attempts at introduction of anything into the cage was greeted by the usual snap, and a hyena's jaws have a phenomenal grip. Death was ushered in by a free bleeding at the mouth and convulsions. At the post-mortem the blood was found to come from the lungs, which were partly engorged. The spleen also was the seat of hæmorrhagic lesion (infarction). The spinal cord in the lumbar region was inflamed and softened through and through.

Three puma cubs, born upon the grounds, and of the same mother, in two successive years have been victims to the same misfortune, but in their cases the disease was probably due to injury from falls, the animals persisting in climbing about and occasionally getting a bad tumble. I understand that a travelling menagerie has lost several lion cubs from spinal affections, and probably this has been an experience in all collections of caged beasts. Two of the pumas I killed, as they, at the end of several months, had become hopelessly crippled in their hind parts. One of them, under the exhibition of strych. sulph., fairly recovered. It at first suffered from a general paralysis of all the limbs. The appetites of all remained voracious, after their kind, the fore-legs and quarters developed, and their tempers showed no sign of degeneracy, they being the most spiteful of all the Carnivora, and prompt to strike out, even when unable to do more than drag themselves to the bars. This unconquerable viciousness seemed strange, as we have five adult pumas, including two males, in a common cage, who live together in peace, and never offer to strike at lookers-on.

Possibly the experience of others in the care of wild beasts may throw some light upon the nature of this spinal affection—supposing it not due to direct injury. I will add that the hyena, during life, passed for a male, the keeper being so assured through its actions, that he was unwilling to credit the discovery, at the dissection, of ovaries and other female properties. The determination of sex in the spotted hyena is very difficult. The superintendent of one of the most important Zoological Gardens in the country stated last year to me that of the two specimens under his charge he did not know the sex of one or the other.

Yours, very truly,
Charles A. Todd, A.M., M.D.,
Medical Director St. Louis Zoological Garden.

St. Louis, Mo.

IV.—CONTAGIOUS (?) KERATITIS IN THE COW.

Editor of Journal of Comparative Medicine:

In compliance with your request I send you this report.

Was called to examine the cattle of a dairyman at Bergen Hill, N. J., which were suffering from an apparently infectious disease of the eyes.

Two weeks before he had purchased a cow, which had been brought from the upper part of New York State. Was in good health, and about twelve years of age. Three days after the purchase he noticed a slight watery effusion, and two days later a small grayish disk appeared on the cornea just over the pupil of the left eye, and continued to grow larger. Still he felt no concern till he noticed the same symptoms in the eyes of one of his own cows, and two days later another (a heifer) showed the same signs. It was at this point that I saw the cattle.

The eyes of the first cow were totally destroyed. The grayish disk had extended over one-third of the cornea. The fibrous membrane of the eyelids, conjunctiva, etc., were suppurating or greatly congested. Four other cows were affected, and showed the different stages of the disease as follows:

A lachrymal effusion only in an animal which had had the disease during two days.

The same effusion and a grayish disk in a case of five days' standing.

In the other two, of ten and twelve days' duration, the disk had enlarged and a partial suppuration taken place.

All were affected in the left eye first, and the disease continued more severe in that than in the right.

I gave an antiseptic of boracic acid in the first case, in connection with belladonna, and to the other four, careful washing with cold water, belladonna solution being injected with syringe.

The eyes of the first cow are totally destroyed. They are still greatly congested, and are apparently being absorbed. The animal is, however, in good health.

The next two cattle affected can still see, and their eyes are slowly recovering their normal condition.

The symptoms of the two last affected have entirely disappeared; but in all the small white disk still remains upon the cornea.

No other cattle of the herd have been affected, and those affected were all in perfectly good health.

Can we consider this a case of malignant inflammation of the cornea transmitted by actual contact, or is it a new disease of the eyes—infectious and perhaps parasitical—similar to that which has lately affected the cattle in certain districts of the West?

WM. H. ARROWSMITH, D.V.S.

3 WAYNE ST., Jersey City.

V.—ULCERATION OF THE ŒSOPHAGUS IN A MULE.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

In March, 1881, I was called by the Pennsylvania Coal Company to see a mule—the symptoms denoting general debility, staggering gait, difficult breathing, slavering from the mouth, difficulty in swallowing fluids, which were returned by the nose. The cellular tissue along the œsophagus being distended, I concluded I had a case of ruptured œsophagus to deal with. But upon inquiry, learned there had been no violence perpetrated; he had not choked, had worked well, and ate well until three days previous. Nothing was left now but to cut down upon this impacted mass and ascertain its source. I made a free incision posterior to thyroid glands—this being the most dependent part—when there escaped about three quarts of finely masticated hay and grain in a semi-fluid form. The surrounding tissues being so diseased, I dissected this away, exposing the œsophagus, where I found a fistula that would admit my three fingers. After dressing the edges, I closed it with silk sutures (having nothing better with me). I ordered gruel diet, the head to be tied to the rack, the wound dressed with borated cotton, saturated in carbolized oil, and retained by many-tailed bandage. They gave him bran mash, which, for four or five days, passed through the opening some; it eventually closing, giving but little trouble. I saw him about four weeks after; he was much improved, the diseased tissues being nearly reproduced by new.

L. E. WHEAT, D.V.S., Ont.

SCRANTON, PA.

VI.—A THREE DAYS' WESTERN EXPERIENCE.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

On Thursday of last week I answered a telegram to Columbus, this State, where I found a terrible and destructive disease among 300 steers and heifers fed at the starch factory. Seventeen had died prior to my getting there, and a like number were sick. I had many of them caught, and found their pulses ranging from 60 to 70 and 80, according to the time they were affected. I determined to kill one, the one farthest advanced in the disease, a heifer; pulse 108; did not bleed her; found every organ unsound except the lungs; the spleen, on the surface a dark muddy brown, on the inner surface a brown-black, resisting pressure by the finger no more than would soft mush. The kidneys were darker than normal, and when cut into presented a black surface containing bloody water, while the substance was broken down like that of the spleen. The liver, though not so soft, was highly discolored (dark), and the gall-bladder, though not as large as many I have seen, contained bile as black as ink. The bladder contained a dark bloody fluid, such as equal parts of blood and water would present, but vastly darker. The entire line of the bowels showed inflammation, and the peritoneum a greenish yellow. The heart was pale-colored and flabby. Nothing appeared in the bowels except the starch offal. I ordered the starch feed discontinued, and for the sick animals tincture of aconite and of belladonna to reduce the circulation, and podophyllin and calomel to regulate the liver. I also added spirits of nitre as a diuretic, and am waiting the result. Of course very little may be expected from the very sick ones. Could you throw any light upon the cause? Is it malaria or the result of feeding too much corn stuff and no hay or straw?

Friday I answered another dispatch, forty miles from here. A horse ran off with a buggy and broke the upper pastern bone. He rested on the heels of his shoe, the toe elevated. I had the shoe taken off and one put on reaching back four inches from the heel; put on the heels at extreme ends, turned up half an inch. Still his pastern, on pressure, descended down near the heels ot shoe. I had a block of timber fashioned to fit under the heel, with two holes in it to receive the turned-up heels of the shoe, with a pledget of muslin for the pastern to rest on, and left him resting quietly on it; ordered constant cold water and tincture of arnica applications. I had an extraordinary case on Saturday. Will write you again.

J. N. NAVIN, V.S.,
Veterinary Editor Indiana Farmer.

VII.—CATARRHAL PHTHISIS IN A COW.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

The cow from which the lungs were removed was three-quarter Jersey and one-quarter Ayrshire, aged eight. The animal had been for four years on the same farm. Up to March, 1881, the cow had been in the best of health. In March, however, she commenced coughing, and lost flesh rapidly until her death in July. The animal was examined by a so-called veterinary surgeon, and he diagnosticated consumption. At the necropsy the lungs were the principal organs diseased. A portion of them was consolidated and gray in color. The lungs were examined microscopically, but no evidence of miliary tubercles found. But the condition commonly known as catarrhal phthisis existed; that is, large portions of the lung were consolidated, the alveoli being filled with degenerating epithelum and debris, or cheesy masses. The case is of interest, I think, in showing how rapidly the disease progressed and terminated in the death of the animal. Would the milk of such an animal be injurious?

GEORGE H. PARKINSON, M.D.

MIDDLETOWN, Conn.

VIII.—A CASE OF SUPPURATING EPIDIDYMITIS.

EDITOR OF JOURNAL OF COMPARATIVE MEDICINE:

I was recently called by telegram to Bangor, Me., to visit a diseased horse, and it proved to be a very singular case.

I found the horse with a running sore about five inches posterior to the scrotum. I think they told me it had been running about two years. I cast the horse and made an incision at the opening of sore, followed it from three to five inches, and found the testicle grown to the walls. I dissected it out, and found the epididymus externally in almost a normal condition, but filled with pus internally. I operated on him three weeks ago; he is now at work, and well healed.

E. I. BRACKETT, V.S.

LEWISTON, Me.

IX.—URETHRAL CALCULUS IN A BAY GELDING.

REPORTED BY JOHN CUFF, D.V.S.

On July 13th, 1881, I was summoned to see a bay gelding, aged 8 years, the property of the Consumers' Ice Co., of this city.

The animal in question I found to be suffering severe colicky pains, and occasionally stretching himself, evidently with a desire to micturate. I ordered the following draught:

℞
Tr. Opii, et.
Sprts. nitros, dulc. et.
Ether Sulph. āā., ℥ i.
Olei Lini, ℥ vij.

Misce; sig.; at a draught.

As no improvement followed after a few hours, I made a rectal examination, and found the bladder distended, and diagnosticated retention of urine.

When an attempt was made to introduce a catheter into the bladder, it was found that the urethra was plugged by a hard, resisting substance, and the retention of urine found to be secondary to a urethral calculus.

To allow the obstruction to remain would have soon terminated the life of the animal. I again ordered

℞
Tr. Opii, ℥ i.
Oleum Lini, ℥ vij.

Misce; sig.; at once, and decided upon an early operation.

July 14th, at 8 o'clock A.M., I found the animal still suffering intense pain, and unable to micturate. I had him immediately transferred to my infirmary, 150 Jane street. When the horse arrived, the breathing was hurried and shallow; pulse, 70 per minute; temperature, 108° F.

Everything being ready, at 1 o'clock P.M. the animal was cast. Five cuts were made in the integuments, and the incision extended through the underlying structures and urethra until the calculus was exposed and removed. The calculus was egg-shaped and weighed two ounces. The wound was closed with a few interrupted sutures.

Time of operation, including casting, was only seven minutes.

The gelding, as soon as loosed, rose to his feet and voided, quite freely, a large quantity of urine. The symptoms of pain and uneasiness rapidly disappeared.

The after treatment was:

℞
Spts. Frumenti, ℥ ij.
Decot. Lini, Oj.

Misce; sig.; draught, and a diet of bran mash, oatmeal gruel and demulcent drinks.

Two hours after the operation the breathing was still hurried; pulse, 48; temperature, 102° F. Ordered:

℞
Spts. Frumente, ℥ iv.
Tr. Opii, ℥ i.
Oleum Lini, ℥ vij.

Mix; sig.; drench.

At 6 o'clock P.M. the same day the breathing had become nearly normal; pulse, 40; temperature, 100° F. Ordered:

℞
Hydrastis Canadenss, ℥ i.
Inf. Lini, ℥ vij.

Misce; sig.; at one draught.

July 15th, 6 o'clock A.M., patient doing remarkably well; all evidence of pain had disappeared; a small part of the urine passed through the artificial opening. The horse was allowed a liberal diet, and all medicine stopped except the alcoholic stimulants, which were continued in small quantities until July 30th. At this date the artificial opening was found to be thoroughly united, and the sutures were removed. A cathartic was given.

August 19th, the patient was discharged cured, and seven days later was at work, and has been ever since, apparently as well at before the attack.

150 Jane St., New York City.

PROGRESS OF VETERINARY SCIENCE.

FOUQUET'S METHOD OF PRODUCING EITHER SEX AT WILL, of which there was much talk a year ago, has, it is said, been further tried and with good results.

The method consists in feeding up the cow, while the bull is put on low diet, and his sexual powers weakened by previous constant exercise of them.

A NEW PARASITE IN PORK.—J. Duncker, of Berlin, has discovered a new parasite in pork. He describes it as a small leech-like worm, of a hitherto undescribed species. The animals are found moving about very actively among the muscular fibres and the connective tissue investments. The "Zeitschrift fuer mikroscopische Fleischbeschan und populaere Mikroskopie," contains a full description of them, accompanied by illustrations.—*Chicago Medical Review.*

LAMPAS.—Many horses fall off in flesh and refuse to eat from the above trouble. Until this trouble is recognized, the horse suffers and fails to respond to the effects of various tonics, etc., administered to restore his failing appetite. If the mouth is examined, when lampas exists it will be found that the gum has grown down even with the upper front incisors, and often ahead of them. The remedy is to cut out the redundant growth, or burn it down with a hot iron. Some experienced horsemen say that this may be remedied by feeding on corn in the ear.—*Southern Clinic.*

MALARIA IN HORSES.—Dr. Moore (*Country Gentleman*) believes that horses may be subject to that aerial poisoning, and even die from it. In answer to a correspondent, he says: "While I was free to state at first that I could not say positively what caused their death, yet I think that later investigation will prove it to be malarial fever, and paralysis of various organs as a consequence. The throat was paralyzed, and later the limbs and tail were partially or wholly so." He then relates a case in his own practice of what seemed to be malarial poisoning.

TREATMENT OF CHICKEN CHOLERA.—The remedy used by Dr. J. W. Cooper is:

Cayenne pepper, two parts; prepared chalk, two parts; pulverized gentian, one part; pulverized charcoal, one part—all by *measurement* and not by weight. Mix all well together, and form a paste with either lard or mutton suet; and, for a fowl already diseased, give a piece the size of a common marble, once a day, and keep in a warm, dry place 48 hours, when a cure will be effected. As a preventive, make a paste of cayenne pepper, one part; prepared chalk, one part; pulverized gentian, two parts—by measurement as before. If the disease be in the neighborhood, give, once a week, an ordinary sized pill to grown fowls—smaller birds in proportion.

Of this treatment the essential thing is the cayenne pepper. Its utility is well established.

A MOST INSTRUCTIVE ARTICLE ON THE HORSE will be found in the last edition of the *British Encyclopædia*. The anatomy of the horse (written by Prof. Flowers) has received an impetus since Huxley took it as the theme for his celebrated lectures on evolution. The history and management of the animal are treated of by E. D. Brickwood, and the racehorse is described in an article by E. D. Brickwood, Major J. R. Hubbard and W. T. Chester. "American Horses," writes Mr. Brickwood, "have sometimes been sent over to compete in England, but, on the whole, they have not been very successful, as they have found the English horses too good for them."

A NEW HORSE.—M. Poliakoff, the distinguishsd Russian naturalist, has examined a horse presented by Colonel Prejvalsky to the St. Petersburg Academy, and decides it to be a new species, which he has named *Equus Prejwalskii*. It appears that the new representative of the family of undivided-hoofed mammals is in some respects intermediate between the domestic horse and the wild ass, but it differs from the asinine genus in having four callosities, one on each leg. In the form of skull, absence of dorsal stripe, and other particulars, it resembles the domestic horse. This newly-recorded animal is indigenous to the plains and deserts of Central Asia, and has not hitherto fallen under the dominion of man.

THREE FOALS AT A BIRTH.—In March last an English mare, 21 years years old, gave birth to three foals. The first came dead, the other two alive. A couple of years previous to this, the same mare brought forth twins. The latter, even, was extraordinary for a mare, but triplets are much more so. Cows often produce twins, and occasionally triplets, or a greater number. Not long since we heard of a cow dropping *seven* calves during the day, all of which were alive. We should like to know the weight of these at their birth, and their subsequent history. Sheep often produce twins and triplets, and a greater number of lambs are not uncommon. Sows generally drop from seven to ten pigs, and now and then we hear of this number being doubled, or even this exceeded. Twenty-four live pigs at a birth is the maximum within our recollection.—*Live Stock Journal.*

HOW TO KILL ANIMALS WITH A BLOW.—The end to be reached by a blow upon the head is the derangement of the brain, which causes loss of consciousness, and therefore insensibility to pain. Many persons strike too high, and fail in bringing the animal to the ground—not from a too feeble blow, but a wrong application of it to the head. The point to be aimed at in horses is the point of intersection of the lines joining the base of the ear with the opposite eye. There is little or no brain "between the eyes," and this is too frequently the point struck by the axe. With cattle, the brain is nearest the surface, and most readily reached by a blow given on a point which is the intersection of lines drawn from the base of each horn to the eye on the opposite side of the face. In all cases when a blow is administered, the head of the animal should be securely fastened, and as a precaution against any jerking of the head, it is well to blindfold the animal.—*Country Gentleman.*

INTESTINAL CONCRETIONS IN THE MONKEY.—The Bezoar or guliga stones are concretions or calculi formed in the "stomach and intestines" of the red monkey, a species of Semnopithecus abundant in the interior districts of Borneo. Mr. A. H. Everett says (in the *Ann. and Mag. Nat. Hist.*, March), that "accounts vary very much among the natives as to the exact position in which the guligas are found, some saying they may occur in any part of the body, others that they occur only in the stomach and intestines, whilst I have heard others declare that they have taken them from the head and even the hand." (Everett does not state what would seem more probable, that they may be renal calculi.) The monkeys drink the water of certain springs, which must be saline mineral springs, or the creatures are cut off from the use of fresh water. Everett adds that "the widespread idea of the medicinal virtue of these concretions would lead us to suppose that there is some foundation for their reputation."

SPLENIC FEVER IN THE DOG.—A very complete account of this somewhat rare affection is given by H. Engel, in *Wochenschrift fur Thierheilkunde und Viehzucht*, July, 1881. After giving the literature of the subject, which is very slight in amount, he relates the case of a shepherd's dog which ate the flesh of a lamb that had died of splenic fever. One evening soon after this, the dog showed signs of restlessness; he barked and whined all night, and did not eat. In the morning he had a fever, with a painful swelling upon the back. He died the same day. Two other dogs caught the disease from this one. They were taken at once to the dog hospital, and were found to have a temperature of almost 108°, and a pulse of 100. They were treated with a mixture containing half an ounce of brandy and ten grains of carbolic acid, internally, and the carbuncles were frequently washed with carbolic water. But the patients soon died.

THE DOG AND TAPE-WORM IN ICELAND.—Some serious facts concerning the above are recorded by Mr. St. George Mivart in a late number of the *Contemporary Review*: "The egg of a certain tape-worm may be voided by some dog into a stream or rivulet, and if such egg be accidently drank in by a human being, it grows into a kind of bladder-worm, the ravages caused by the growth of which are so serious that in Iceland (where the social conditions lead to the maintenance of many dogs) it is estimated to be the cause of one death out of every seven. So great is the evil that the Iceland Legislature, some years ago, ordered that all the dogs of the island should be simultaneously purged and their excreta burned. These facts with respect to the dog show that the filthy unclean habit in which so many ladies indulge of allowing their lap-dogs to lick their hands and faces, is a practice not unattended with danger."

THE DISTANCE ANIMALS CAN SWIM.—Animals themselves are capable of swimming immense distances, although unable to rest by the way. A dog recently swam thirty miles in America in order to rejoin his master. A mule and a dog washed overboard during a gale in the Bay of Biscay have been known to make their way to shore. A dog swam ashore with a letter in his mouth at the Cape of Good Hope. The crew of the ship to which the dog belonged all perished, which they need not have done had they only ventured to tread water as the dog did. As a certain ship was laboring heavily in the trough of the sea, it was found needful, in order to lighten the vessel, to throw some troop-horses overboard, which had been taken in at Corunna. The poor things, my informant, a staff-surgeon, told me, when they found themselves abandoned, faced round and swam for miles after the vessel. A man on the east coast of Lincolnshire saved quite a number of lives by swimming out on horseback to vessels in distress. He commonly rode an old gray mare, but, when the mare was not to hand, he took the first horse that offered.—*Popular Science Monthly.*

DEATH FROM RUPTURE OF THE RECTUM OCCASIONED DURING ATTEMPTS AT COPULATION.—The following case is reported by Dr. A. A. Holcombe in the *Vet. Review*:

I have just lost a 14½-hand six-year-old brown mare that was sent to a sixteen-hands-high stallion to be covered. A young man about 18 years old was in charge of the stallion, and during the attempt to effect copulation the penis entered the rectum and lacerated the left wall to the extent of six inches or more. The wound through the organ was situated about eight inches from the anus, and extended some six inches into the surrounding tissues. But slight hæmorrhage resulted. Colicky pains came on in a short time, and lasted until death. The fœces gained access to the wound and served to increase the irritation and suffering. Excessive effusion followed, during the course of twelve hours. Peritonitis set in, and at the end of 36 hours the patient was destroyed, as it was believed impossible that recovery could take place. No post-mortem examination was made.

HOW OSTRICHES DIGEST.—A correspondent of the *Pharmaceut. Journal*, writing from the Cape of Good Hope, where the ostrich is domesticated, states that he is perfectly certain that the digestive powers of the ostrich are very small, and only effective on certain kinds of food, and that the tenpenny nails and iron bolts upon which its digestive reputation is based, are not digested at all, but simply bent and crushed by a powerful gizzard that is so thick and tough as to be with difficulty cut by a knife. The writer vouches that he has himself seen buttons and coins that have been worn to the thinness of wafers by the grinding action of this organ, and that the hardest stones assume a fine polish under its action. It would be a pity to spoil, by a paraphrase, the *naïvete*, of what follows: "When a bird is in poor condition, and fed on maize, by carefully dividing the breast feathers, you can hear this gizzard, or living grinding-mill, at work." Presuming upon the possession of such an apparatus, ostriches eat so enormously that stoppages, which, unless relieved, will kill a bird in twenty-four hours, not unfrequently result; powerful drastics are then given, of which they are said to require a larger dose than a horse.

THE BLOOD IN HIBERNATION.—In the autumn of 1879, Professor V. Wittich received twelve living German moles (*Mus montanus*), in order to investigate the amount of glycogen in the liver during their winter sleep. One animal was killed accidentally immediately after its arrival, and the results obtained on a microscopical examination of the blood, led to an examination of the blood of the other animals, all killed in perfect health, and in all the same appearances were found. One of the animals had died on the journey without signs of disease, although perhaps in consequence of a bite from another animal.

The blood taken from a vein in the peritoneal cavity contained a large number of thread-like moving objects, which moved the blood corpuscles lying near them, and, after diluting the blood with a-half per cent. solution of chloride of sodium, presented an appearance identical with that of the spermatozoa of the frog. These organisms appear to be the same as those described by T. R. Lewis, as existing in the blood of healthy rats. They are much larger than the spirilla met with in the blood of relapsing fever They were found in the blood from various parts, arterial and venous, in every animal. They disappear from the blood as soon as decomposition sets in and the putrefaction-bacteria appear. They were very numerous, ten or twelve being found in every drop of blood, and they furnish a new proof of how large a number of parasitic organisms may exist in the blood without causing any disturbance to the general health. Attempts were made to inoculate guinea-pigs, but in every instance with a negative result. —*London Lancet.*

UPON THE PRESENCE OF THE VIRUS OF RABIES IN THE CEREBRAL SUBSTANCE OF MAD ANIMALS.—Mr. Pasteur has presented recently at the Academy of Medicine of Paris a note upon the presence of the rabid virus in the brain substance of rabid animals. Since the fact published by Meynert, in 1869, that nervous lesions were found in the spinal marrow of two children which had died with hydrophobia, similar facts were reported by many pathologists in Germany, France and America, which demonstrated the presence of lesions of the nervous centres amongst those of rabies. Mr. Pasteur has had the idea of hunting the virus in the substance of nervous centres in animals which had died of that disease. His experiments, assisted by M. Chamberlain, Roux and Thuilier, were successful. The rabid virus exists in the substance of the nervous centres with a power of action as great as in the saliva. More than that, in inoculating the cerebral substance of an animal dead by hydrophobia, in the brain of a trephined dog, Mr. Pasteur has succeeded in shortening the duration of the inoculation, which thus does not last more than a week. This will facilitate the experimental researches upon this disease, which is yet so mysterious.

THE TURCOMAN HORSE.—A great deal has been said and written about Turcoman horses, I am fain to believe, by people who make their statements from mere hearsay, who never had an opportunity of judging personally of the wonderful qualities they so freely announce. During my present stay at Merv, and a pretty long one among the Yomuds, I have had ample opportunities of judging of the powers of Turcoman horses, and of hearing their praises sung by no cold partisans of the breed—Turcomans themselves. Yet I never witnessed, or even heard of, among the Turcomans, such exploits as were lately printed in a Russian book of travel. At the moment of writing I have Turcomans at my elbow (alas! only too many of them), and I have over and over again made searching inquiries about the power of Central Asian steeds.

A first-class Turcoman horse, after a month's special training, and with ample and special food, will do from sixty to seventy miles a day and keep it up for an apparently unlimited period. It is this sustained power which is probably their only excellence which has not been overrated. For speed they could not hold their own against the higher class European horses. As a rule the Turcoman horse is very "leggy," but extremely graceful of limb. His chest is narrow but long. His head is handsome; but the neck at the point of junction has a strangled appearance. The neck, too, far from having the proud curve of an Arab horse, is not even straight. It is slightly concave from above, which gives to some otherwise gazelle-looking animals a lamentable resemblance to a strangely abnormal camel.—*English Correspondence.*

STRING-HALT.—This peculiar snatching up of the hind leg is no doubt produced generally by an affection of the hock. The extensor-pedis seems to be the muscle most severely affected, though not the only one, however, which is disturbed and thrown into spasmodic action. The producing causes may be accurately attributed and confined to two in number, the loss of nervous influence and volition, and the peculiar construction and articulation of the hock-joint. If the leg of a horse be stripped after death of its muscles and the ligaments of the limb remain undisturbed, and if the limb both above and below the hock-joint be mechanically straightened out by the hands of the operator, the moment he lets the limb loose from his grasp it will immediately spring back again to a bent position. Thus an imitation of string-halt is produced, the balance of power not being equally proportioned in the limb. The articulary ligaments of the hock-joint are much stronger than the muscles of the thigh; consequently the moment the horse lifts his foot to advance or move it forward under his body the limb is spasmodically snatched up by the power of the ligaments. Whether this explanation be well founded or otherwise, the fact is well established in my mind from practical experience and close observation made on this spasmodic affection of the muscles that the seat of the difficulty is in the hock-joint. I have noticed recently published accounts by some of the knowing veterinary surgeons that string-halt can be cured by blistering. I have yet to see a single cure that ever has been accomplished by blistering or any other medical treatment. I have no hesitancy in asserting that no treatment is of the slightest avail. Horses afflicted with string-halt are just as qualified and able to perform all kinds of work or driving as those not affected with it, and in many instances the spasmodic action of the ligaments does not increase but remains in the same condition as when the attack first developed itself.—Dr. E. S. SMITH, in *New York World.*

PREVENTION AND TREATMENT OF MILK FEVER.—One of the best methods of preventing milk fever, is to feed the cow, several weeks to several months before calving, according to its danger—if in winter, on ordinary dry hay only, with a quart or so of wheat bran, night and morning, to keep the bowels open; if in summer, let her run on a poor pasture, and at all times have a large lump of Liverpool rock salt, to lick at pleasure. If the cow has been dried off a couple of months before due to calve, watch the approach of parturition, and if the bag shows extra full, then begin to draw a small quantity of milk from it two weeks or less before her time, and increase this, according to the fulness of the bag, till the calf is dropped; then milk her clean after the calf has sucked, at three equal intervals of every twenty-four hours. In the meanwhile, do not increase her feed for a month or more, till all danger of fever is passed. If the cow has continued to give milk up to within a few days of the time for her to calve, as is sometimes the case, then perhaps it will not be necessary to milk her till after calving. Keep her dry and sheltered from storms and from excessive cold or heat. See that the water she drinks is pure, and that she has all she wishes to take, at least three times per day. Never let this water get icy cold, and after calving, give it slightly warm for a few days.

As soon as affected, if not already in a comfortable stable, put the cow into one; litter the floor well, and always keep this dry and clean. One of the most simple and effectual prescriptions for this disease is half a pound of Epsom salts, dissolved in three or four quarts of warm water, mixed with two table spoonfuls of sweet spirits of nitre. Wet up a small feed of wheat bran with this. If the cow will not take it so, then put the salts and nitre solution into a strong-necked bottle, trice up her head and pour it down the throat. Repeat this every morning till cured. This simple remedy rarely fails, even in the worst cases, if all the above directions are carefully followed. Rub the bag with lard, mixed with the last strippings, every time the cow is milked. This renders the bag soft and pliable, and prevents maminitis.—*National Live Stock Journal.*

PASTEUR'S EXPERIMENTS IN VACCINATING ANIMALS.—When Pasteur discovered a method of so cultivating the specific germs of chicken cholera as to give them the power of preventing the disease when inoculated, he asserted it to be possible to treat other specific organisms in the same way. This he has recently done for the virus of charbon. He was furnished with an unusually good opportunity of testing the power of his modified virus. The Agricultural Society of Melun put at his disposal sixty sheep, to be experimented with as he chose.

Ten of these were separated from the rest and kept subject to inspection. Twenty-five others were inoculated twice with the cultivated virus of charbon. After a sufficient time these and another twenty-five sheep were inoculated with the pure virus of the disease. The fifty sheep were then allowed to mingle together in the same inclosure. The twenty-five not "vaccinated" did not take the disease, while the others did. Those of the latter that died were buried in an inclosure together. A certain number of vaccinated and unvaccinated sheep were then turned into this inclosure and allowed to pasture there. The unprotected were soon attacked with the charbon, while the others were not. Thus M. Pasteur claims to have demonstrated not only the protective power of the modified virus, but also a previons assertion. that sheep pasturing upon ground where animals killed with charbon are buried, will catch the disease.

M. Pasteur made similar experiments with ten animals of the bovine species, and asserts that the same protective power was secured to them.

Pasteur's communication was received with applause by the society before which it was read, yet it was not allowed to pass without criticism. M. Colin claimed, and with justness, that similar results had been obtained by himself a year ago, and by Toussaint a little later. He might have added that Greenfield and Burdon-Sanderson had also experimented successfully in the same line. Still no one has ever obtained successful results upon so large a scale or with so much uniformity.

It was also suggested that it yet remains to be proved that the preventive power of the inoculations lasts for any considerable length of time.

Whatever be the question of priority, however, it is certain that Pasteur's results have attracted the most attention of any yet made in this line. And they will probably give a fresh impulse to studies in this direction. It must be remembered that the successes in preventive inoculation have, so far, been with diseases having a close pathological resemblance. And before the experiments of Pasteur, their practical application did not seem easy.

At the meeting of the International Medical Congress in London, last August, Pasteur reviewed his experiments, and renewed more strongly than ever his claims. A full account of his paper is given in the New York *Medical Record.*

CHICKEN CHOLERA.—A very intelligent account of this disease, of which so much has lately been said by M. Pasteur, has. been given by Dr. S. J. Parker, in the *Country Gentleman.*

This disease begins by indigestion. The infected fowl eats heartily and drinks excessively, from a morbid appetite, but with a paralysis of digestion, so that at night it goes to bed with its crop enormously distended. It may several times, by a diarrhœa, disgorge this load; but usually it slowly gets off of the roost with its still distended crop. It may eat again voraciously, but usually is dull and sluggish. The outer edges of the combs are now purplish, but the base of the comb has the natural color. In this stage the fowl can be saved. I find it best to force down its throat *Eucalyptus globulus*, ten drops of the strong tincture; common salts, four to six grains; and half a teaspoonful of ground cayenne (red) pepper. One dose, in a tablespoonful of water, is given at once. If the dose takes effect, digestion is resumed, and in twenty-four hours the fowl is relieved, or decidedly better.

If the disease goes on unchecked, the next symptom is costiveness, with a high fever. The fever usually assumes the type of all critical fevers in the human subject; that is, the hen may seem comfortable, or cold, or with shivers, until nine or ten o'clock A.M., when the fever comes on, with panting breath, legs hot to the hand, and body very hot; comb purple, skin at first a little purple, which becomes on the second, third, or fourth day almost black with the heat of the fever. At four or five in the afternoon the fever recedes, and for an hour or two the fowl may be lively, feed, and seem as if better until it goes to roost. But each day the fever is worse, until, generally in the night, the loaded crop and bowels are emptied by a free discharge of dirty, blackish-green matter, with whitish matter stained yellow. If this discharge is sudden and profuse, the fowl soon after becomes helpless and dies, with a few kicks, croakings, and convulsions. If, however, there is a diarrhœa that keeps the crop and bowels free, there may be the same kind of discharges, which may be small in quantity and not oftener than in health; the blackish-green, the fluid like starch water, and the white overlaid with bright yellow being the only marks of the discharges that really have any peculiarity differing from the discharges of health which an ordinary person can discover. The marks of this stage of the disease are the purple, dark blood in the combs, the sick appearance of the fowl, the panting breath, and a peculiar rise and fall of the under bill, or mandible of the fowl.

This form of the disease is a lingering one, and the patient only lingers a few days longer, and dies a less painful death. A few, say one out of ten, may not die at all, but, after weeks, may half recover. I say "half recover," because I never saw a recovered bird that made a useful fowl, after there has been any diarrhœa.

THE DANGERS OF THE LIVER ROT IN SHEEP.—In a report on the liver rot by Finlay Dunn, in the Journal of the Royal Agricultural Society, England, we are told that "a succession of wet seasons has spread the liver rot widely through most of the midland, western and southern counties of England." The increase of the average rainfall by one-fourth has cost England, in the one item of sheep sacrificed, no less than 10,000,000 pounds sterling!

There is no telling when the frightful disease may devastate the flocks of the United States. There should, therefore, be an accurate knowledge of its character, and mode of treatment, and prevention among veterinarians. The following concise account, given in the *Country Gentleman*, may be of interest:

"The sheep rot is caused by a small parasitic animal (*Fasciola hepatica*), which flourishes in ducts in, and leading to, the liver; on this account it is called the liver fluke. The animal resembles a leech, it being a sucking worm, of an oval shape, thick and rounded at one end.

"The mature fluke, as found in the sheep, stands at the end of a series of transformations through which the parasite has passed. To begin with the egg, it, after leaving the mature fluke, passes into the intestines of the host, and is thrown off in the excrement of the sheep. If the egg falls upon dry soil it soon perishes, but if moisture is met with, it hatches into a small embryo which moves by minute hair-like appendages. In a short time the young fluke is provided with legs, and in this state it enters into the body of some snail, and there begins the first part of its parasitic life. The fluke soon becomes encysted or enclosed in a kind of sack, within the flesh of the snail. In this state the fluke is taken up by the sheep, which feed upon grass bearing the snails, and when in the stomach of the sheep, the active leech-like form of the parasite is quickly assumed, and then, finding its way to the ducts of the liver, it reaches the last and perfect state of its transformations, and soon does its destructive work. It is now easy to see the relation between the wet season and the prevalence of the fluke the following year. The hatching of eggs is dependent upon an abundance of moisture. The young fluke, after hatching from the egg, must find a snail and enter its flesh, which it will be much more apt to do in a moist season, the distribution of snails being wider and their number greater during a period of rains.

"*Symptoms of the Disease.*—Flukes, to a small number, may be present in sheep and not be suspected. In the first stages of the 'rot' there is an increased appetite, and a tendency to fatten. Some English feeders have exposed their flocks to the fluke to hasten their animals for the butchers. It may be said that the fat is high-colored and, of course, not of the best. Soon after this period of unnatural excitement there comes a falling away in the condition of the animal; the color of the eye becomes 'tallowy,' the skin wet, and the wool loose. At length a watery tumor appears below the lower jaw, after which the sheep soon dies in a state of rottenness.

"*Remedy.*—The treatment must be wholly in prevention, for when the flukes have once found entrance to the sheep's liver in any considerable numbers, there is no removing them. The parasites must be kept from entering the sheep, and as they enter in the flesh of snails, the sheep must be kept from feeding on herbage on which the snails are found. This requires that the sheep be kept from wet meadows and all pools of stagnant water. The prevention of the liver rot in sheep is to a large extent a question of drainage."

NEWS AND MISCELLANY.

A **New Veterinary Journal**, called *La Presse Veterinaire*, has just been started in Paris.

The Siberian Plague (*Anthrax*) has been at work among the horses and cattle of Russia during the past season.

A **Disease of the Eyes**, causing total blindness, is reported to be affecting cattle in Lincoln, Ill. Its nature is unknown, or at least not reported.

A **great number** of horses at La Salle, Ill., are affected with a disease which, from newspaper reports, is presumably influenza. But few deaths are reported.

A **Prize of $250** is offered by the Veterinary Medical Society of Paris for the best essay upon the following subject: Can pleuro-pneumonia be propagated by the use of the flesh of animals suffering from the disease?

Pimples, Whelps, Eruptions.—When this condition arises from an impure state of the blood benefit is always found from the administration of half a pound of Glauber's salt in a quart of water, and repeated in twelve hours if necessary.—*Southern Clinic.*

New Veterinary Medical Colleges.—It has been proposed to start a veterinary college in St. Louis, Mo. Measures are also said to be afoot looking to the establishment of a veterinary college in Philadelphia, under the direction of the University of Pennsylvania.

Pen and Plough.—We have to thank the *Pen and Plough* for a kindly and intelligent criticism upon our editorial on "Doctoring Through the Newspapers." The journal in question agrees with us in the main. There is, indeed, but one position that can be honestly taken upon the matter.

A **Peculiar Colic** appeared last July and August among the horses at Red Bank, Long Branch, Ocean Grove and other places in New Jersey. Fourteen fatal cases were reported, the animals generally succumbing to the disease in about one hour. In a few cases they dropped dead on the road.

Anthrax in Louisiana.—A form of anthrax has been affecting horses and mules in the vicinity of Pointe a-la-Hache, La. Swellings or tumors appear on different parts of the animals, which, if not early controlled, rapidly increase and cause death. The loss so far is about thirty-five head.

Alum for Cows in Summer.—It is a custom among our most prosperous German dairymen to drench their cows with a half pound of alum twice a week during the summer months. This is given to cool the blood and protect them from diseases incident to the summer season; at the same time it increases the flow of milk.—*Southern Clinic.*

An Item from Northern New York.—Our correspondent, Dr. G. Henry Kidney, of Malone, New York, writes: "We are having a great many cases of influenza (or pink-eye), also of tuberculosis in cattle. I have also had a case of tapeworm in the dog, caused by eating the bowels of the deer. The Journal of Comparative Medicine and Surgery is a perfect gem, and no veterinary surgeon should be without it."

The Old and the New English Race Horses.—The real difference between the old set and the new set of animals seems to be this: That whereas the earlier runners thought nothing of contesting three four-mile races in a week, and kept their power of doing this year after year, the modern flyer who accomplishes three miles once in his career and does not break down until after he has ceased to be a colt is considered a prodigy.

A Female Boa Constrictor ("Python Molurus") of East Indian extraction, it is hoped, is about to hatch out the first specimens of that snake that have ever been bred in captivity. The Regent's Park, London, Zoological Garden is the scene of the nesting. In 1862 an African python sat for ten weeks on her eggs, at the expiration of which time they were unfortunately removed, it appearing afterwards that a few more days would have seen the little serpents hatched.

Euphorbia Villosa is said to be regarded (Allgemeine Medicinische Central Zeitung, March 26, 1881) in the Ukraine and Gallicia, as an unfailing remedy against hydrophobia, when taken within five or six days of the infection. Unusually good evidence is claimed in its favor. It is strange that so many hydrophobia specifics start from Russia and prove valueless elsewhere. Erroneous diagnosis is most probably the cause for these therapeutic fiascos.—*Chicago Medical Review.*

Death of a Famous Jersey Cow.—Jersey Belle of Scituate (7,828), the property of Mr. Charles O. Ellms, of Scituate, Mass., died on August 11th, of milk fever, having dropped a bull calf the day previous. She was generally regarded as one of the most valuable Jersey cows in this or any country, and many connoisseurs pronounced her the best that has yet been produced. She was ten years old. The milk or puerperal fever is a trouble to which the closely bred Jersey cow is not unfrequently subject.

Exportation of Contagious Pleuro-pneumonia to England.—The report of Mr. Chas. P. Lyman, who was sent to England by the Commissioner Le Duc, to investigate the question of pleuro-pneumonia in American cattle, has been received. It shows that it is extremely doubtful whether single case of the real contagious pleuro-pneumonia has ever been exported from this country to Great Britain, and affords additional reasons why our government should ask to have the case re-opened by the British authorities.

A Curious Epidemic.—A singular disease, to which the veterinarians have not yet given a name, broke out among the cattle in Watertown, N. Y., last month. The stock attacked are blooded animals, and are in the very best condition. Several have died. They are taken first with intense coughing, followed by loss of appetite and shrinkage of milk. When let out where they can have perfect freedom they appear almost crazy, and will bite themselves, tearing out pieces of flesh, and appear in the greatest agony. The attention of the State authorities has been called to the matter.

CANADIAN CATTLE HEALTHY.—Dr. Tache, Deputy Minister of Agriculture, referring to the reports that pleuro-pneumonia exists among the cattle of Nova Scotia, states positively that there is no cattle disease in the Dominion as is mentioned in the British order in Council regarding cattle importation.

NEW VETERINARY PUBLICATIONS.—Dr. Hermann Pütz has published a work upon the Causes and Means of Extinguishing the Lung Plague. In it he gives the history of the abolition of this plague in Holland, and lays great stress upon the value of inoculation.

A valuable work on Veterinary Pathology, by Dr. Hill, is to be published soon by Mr. W. R. Jenkins, of this city. Also, Fleming's Veterinary Surgery, by the same publisher. The same gentleman is soon to publish Fleming's Veterinary Surgery. It will be a most valuable work.

A "CURE" FOR HYDROPHOBIA.—Dr. Buison, of Paris, claims to have cured himself and several others of hydrophobia by a system of vapor baths. The directions are as follows: When a person has been bitten by a mad dog he should be made to take seven of the so-called Russian vapor baths, from 57 deg. to 63 deg. centigrade, hot, one every day, by way of preventive. In case of the malady having distinctly shown itself, the vapor bath should be heated rapidly to 37 deg. centigrade, then slowly to 63 deg. The patient should strictly confine himself to his room until he is quite well.

GRATITUDE.—At the recent presentation-day ceremonial at London University, Lord Granville, in his address, related the following anecdote, which we record as a contribution to the next work published on animal instincts Speaking of the Brown Institute, the noble earl said: "A distinguished member of the Senate was driving along the road in which the institution was situated, when suddenly his hack-cab came to a dead stop. He asked the driver whether his animal was lame or ill, but the driver answered, 'No, sir; I never can get him past this place since he had his corn cured here. He likes it so much that he always wants to stop.'"

DR. NOAH CRESSY is the recipient of a compliment, never before extended, it is safe to say, to a veterinary surgeon in this country, in the shape of an invitation to deliver a course of lectures on Comparative Pathology before the Medical Department of Yale College. To extend the benefits of this course as widely as possible, the Faculty will invite the medical fraternity of the city, as well as the New Haven County Farmers' Club to be present. The first lecture of the course will probably be given early in October. Yale takes the initiative in this matter, being the first of our American colleges to recognize the importance of this branch in a medical course of instruction.

MR. GRAVES, THE SNAKE CHARMER, ON THE CARE OF SNAKES.—Mr. Graves believes that nearly all animals have reasoning powers, but thinks that snakes are devoid of such powers. He is sure that they cannot hear, as he has frequently tried to stir them up by making a great noise, and they would not budge. Their eyes are immovable. He was satisfied that a great many snakes die because their owners do not know how to handle them. He learned how to treat snakes from Mr. Barrett, of the Zoological Garden, Surrey. The handlers should frequently try snakes with food, as it was hard to tell when they wanted to eat, and they should have plenty of water.

Milk as a Cause of Death.—According to Dr. Brush (*N. Y. Medical Record*), the greatest cause of disease among infants in New York City actually arises from the use of diseased milk and the mixture of colostrum with sound milk. It may be considered positively dangerous to give a child milk when this milk has been drawn from a cow before the third or fourth day after calving. Nature then presents in the lacteal fluid of the cow a substance which is highly purgative, useful to her new-born calf, but certainly prone to give cholera infantum to a child. In cases of pleuro-pneumonia in cattle the milk is absolutely poisonous

The Manure Nuisance in New York is the most troublesome problem that the Health Board has to solve. The secret of the trouble is that the manure is worth money, and that its price has been raised until its value is fictitious. The owners and keepers of horses are responsible for the nuisance, and they should be compelled to see that the manure that is produced leaves the city. At present the stable owners say that it is better to have one nuisance—the manure mound at the foot of East Forty-fifth street—than to prohibit further cartage of manure to it, and thus make a nuisance of every stable in the city. One thousand loads of manure are produced in New York every day. The Health Commissioners insist that it must not be allowed to accumulate either at the stables or at the dumps.

England and Pleuro-pneumonia in American Cattle.—The veterinary surgeon of the Department of Agriculture, who was sent to England in June last, by Dr. Loring, the United States Commissioner of Agriculture, to investigate the question of pleuro-pneumonia among American cattle landed in Great Britain, in connection with the Privy Council, has returned, and reports that upon his arrival in London, and at his solicitation, an important meeting of the Privy Council was held, the Lord President, the Earl of Spencer, presiding, and that the result of the examination and discussion of the subject which there took place has greatly tended to remove from the minds of the English authorities the strong impression they had formerly entertained as to the existence of contagious pleuro-pneumonia among cattle at the West.

A Monster Turtle was brought on to this city not long ago It is of a variety never seen before in this market. It is seven feet long, four feet three inches broad, and about three feet thick. Its "flippers" or pectoral fins are forty-seven inches long. It is bluish black all over except on the neck, where muddy white spots, and under the throat pink spots, relieve the black surface. The back is marked by seven longitudinal ridges, there being one large ridge in the centre and three smaller ones on either side. The head is roundish and about a foot in diameter. The mouth is eight inches long and two long fangs protrude from the end of the upper jaw. These fangs are exceedingly sharp. Unlike most of the turtle family this specimen has not the power of drawing his head into the shell, and he is also incapable of walking, possibly because of his great weight, which is estimated to be between 1,700 and 2,000 pounds.

Another New Cattle Disease.—The *Drovers' Journal*, Chicago, Illinois, says: "A strange disease has manifested itself among the cattle, in central portions of this State, that seems to be exciting more public mention than the facts would seem to warrant. The disease manifests itself in the animal's eyes, which become watery, then show signs of inflammation, and this followed by 'boil-like gatherings on the pupils of the eyes' We have heard of its outbreak in Menard, Logan, and McLean counties, and in two or three localities further south. A Menard county correspondent says, the most generally accepted theory as to the cause of the malady is that it is occasioned by the combined influences of heat, dust, and scarcity of water. Cattle grazing on timbered pastures do not appear to be subject to attack. Cattle-raisers recall the prevalence of the same disease in previous years of drouth and excessive hot weather. But slight damages resulted then, and it is believed that not much harm will result this year."

An Alligator Sunstruck.—One of the two alligators at Benton Park, St. Louis, was sunstruck recently—the first case of the kind on record, but as it was officially reported by the park commissioner, it will not be denied. The alligator turned over on its back and popped out its eyes and showed other unmistakable symptoms of sunstroke. The park keeper says it was a clear case. He had read of the way sunstruck persons are treated at the city dispensary, but he had neither ice nor ice water with him, and as it was a bad case, one that required immediate treatment, he pulled out his brandy bottle and gave Mr. Alligator a big dram. The effect was wonderful. The patient flopped over on his belly again and swam off, seemingly as happy as a big hungry catfish among a lot of little minnows. This is one of the pet alligators recently donated to the city by Democratic Gus, the saloon keeper on Seventh and Chouteau avenues, and it is said that he was raised on the bottle.

Phagedæna: Is it a New Disease?—In reference to this, Dr. A. G. Bolton, of Mankato, Miss., writes: "Phagedæna is not a new disease as Dr. Bowler seems to think, as you will find by consulting Robert McClune's work entitled *Diseases of the American Horse, Cattle and Sheep*, page 172, published by John E. Potter & Co., Nos. 614 and 617 Sansom street, Philadelphia, in 1870.

"The cause and symptoms given by McClune are the same as Dr. Bowler gave us in the July number of The Journal. I might copy McClune's account of the disease, but perhaps it would take more of your valuable space than you could give, although, if you do not succeed in finding a copy of the work mentioned, I will send it to you."

We believe it is thought in Chicago that the disease was equinia or horse-pox. *The Chicago Medical Review* discussed the matter quite extendedly at the time of its appearance.

Food for Wild Beasts.—At the Jardin des Plantes in Paris, the following are the allowances for the various animals. The monkeys are fed on carrots, cooked potatoes, salad, and bread made from maize and potatoes. The lions, tigers and bears have each five kilos. (including bones) of fresh meat per day. For the panther three to four kilos., and for the hyena, two to three kilos. of the same suffice. The wild cat gets half a kilo. of fresh meat without bones. The falcon gets the same. The eagle is served with one kilo., and the vulture with one-and-a-half kilo. of fresh meat with bones per day. The elephant eats per day four bundles of sainfoin, one decalitre of bran, two kilos. of bread, three or four bundles of oat straw; cost, 6f. The giraffe is supplied with one bundle of lucern, two pounds of bread, one litre of barley, one litre of beans, two litres of maize; cost, two and a-half to three francs. The stag, on a half bundle of lucern and five litres of bran, is kept for about one franc per day. Parrots and similar birds are fed for twenty-five to thirty centimes per day.

SPLENIC FEVER IN DUTCHESS COUNTY, NEW YORK.—A sudden and singular epidemic has lately broken out at Amenia, in this State. The first appearance of the disease was about the 9th of August, when a young and promising cow which had shown no previous symptoms of illness, was found in the morning dead in the pasture. Soon after this discovery another cow of the herd was seen to be slightly ailing, when the whole herd—about twenty in all—was put under the influence of carbolic acid exhalations. Coal tar was also freely used to cleanse and purify the stables, on the supposition that the disease might be one of contagion. In spite of all precaution, however, the sick cow died, another followed in her footsteps, and still another was found dead in the field. Post-mortem examinations showed the disease to be splenic fever or splenic apoplexy. Five cows in all subsequently died. The Governer and State Board of Health were informed of the existence of the disease.

THE HORSE AND THE MAN.—The man has cut away the frog because he thinks that the animal will be injured if the frog touches the ground. He has then cut a deep groove at the base of the frog. This is to give a "well opened heel," as he is pleased to call it. He has scooped away the sole to "give it spring." He has scored a deep notch in the toe for the purpose of receiving the "clip" of the shoe. This is evidently a conservative relic of the time when nails were not used, and the shoe attached by three pointed clips hammered over the edge, one in front and one on either side. Then he has improved the whole of the outer surface of the hoof. As the Creator has furnished this part of the hoof with a thin, hard, polished plate, forming a sort of varnish which is impervious to wet, the farrier, as a matter of course, rasps it all away up to the crown. And as the Creator has placed round the crown a fringe of hair which acts as a thatch to the line of junction and throws off the rain upon the water-proof varnish, he cuts this away with his scissors. Lastly, the Creator having given to the horny hoof a mottling of soft, and partially translucent, brown, gray-blue, yellow, black and white, never exactly the same in two hoofs, much less in two horses, the farrier takes a blacking-pot and brush, polishes up the hoofs until they look like patent-leather boots, all four exactly alike, and then contemplates his work with satisfaction. In his own words, he has "turned out a finished job of it."—*Good Words.*

THE EPIZOOTY AGAIN.—The annual appearance of the influenza or epizooty among horses in the early autumn has become as much a matter of course as the attacks of hay fever on some people. This year an old name has been revived for the disease, viz, "pink eye;" but the symptoms of the malady are not much different from those of former years. The animal's legs begin to swell, the eyes become red and discharge matter, then the tonsils become congested, and a cough appears. Loss of appetite and a generally dejected appearance also accompany the disease.

Veterinary surgeons vary in their ideas of the proper treatment, but the general policy is to give the animal rest, guard against cold, and allay any febrile symptoms; blisters are also used to reduce the swelled limbs and mustard plasters are applied to the neck and chest. Some doctors try to induce a discharge from the nose, which they claim relieves the inflammation in the eyes, by steaming the animal's head.

The disease has been noticed in Chicago and other Western cities for some weeks. Within a week or two it has manifested itself in this city. Probably few large stables are without one or more cases, though many of the stable-keepers do not notice it, as the disease has assumed a very mild form so far.

VETERINARY EDUCATION.—The amount of education possessed by some of the practicing "veterinary surgeons" of Chicago must be rather limited, to judge by a recent occurrence (*Druggist*, September, 1881). One "veterinary surgeon" recently wanted four ounces of tincture of aconite root from a pharmacist, whose curiosity led him to ascertain the fact that the "veterinarian" believed that tincture of aconite root and "sweet spirits of nitre" were one and the same thing.

THE HORSE DISEASE IN ST. LOUIS.—There are 25,000 horses in the city of St. Louis, and at the present time, according to the best reports attainable, about one out of three of them is laid up with the disease which is called "pink-eye." The disease is rapidly spreading, and in its progress much resembles the epizooty which swept over the country from ocean to ocean in the winter of 1872 and 1873. It is not as fatal in its effects as the epizooty. The stablemen seem to have combined to keep the public in ignorance of the existence of the disease. It showed itself here about four weeks ago. It is known to be in existence at the present time in nearly all the large cities of the Union. Its exact nature is unknown, and its origin is as profound a mystery as that which surrounds the epizooty. The veterinary surgeons are studying it carefully, and are succeeding in reducing the number of fatal cases.

The above is a newspaper account of the trouble. It is probable that the disease is really only the epizooty.

A VETERINARIAN SELLING DISEASED CATTLE.—A sensation was caused in Camden, N. J., not long ago by the report that William B. Miller, a veterinary surgeon and an employee of the State Board of Health, had been engaged in bringing to the city and selling cattle affected with pleuro-pneumonia. It was alleged that Miller and a butcher in his employ had seized diseased cattle, driven them past herds of sound cattle, and sold some of them alive and others after they had been butchered. Dr. Miller was called on. He had just returned from Trenton, whither he had been summoned by the State Board of Health. He said the herd in question had been condemned and quarantined by order of the board, and the cattle offered to a number of butchers at the appraised price, but they refused to purchase. He regarded the meat as good for food when the disease was in its incipient stages, and said the medical men on the Board of Health concurred in the opinion. He admitted that the cattle were brought to Camden, but said it was by order of the Board of Health, and they were willing to take the full responsibility for their action. A large mob was present at Washington, which would have interfered had there been an attempt to kill and bury the cattle there. He added: "I apprehend no danger of the spread of the disease by the removal of the cattle, as they were not permitted to come within gun-shot of any others, and I had the car in which they were transported to Camden thoroughly fumigated when it was emptied."

A STRANGE DISEASE.—A strange disease has, it is reported, broken out among cattle in Nova Scotia, and the mortality among the animals attacked appears to be very high. The disease is pronounced to be non-contagious, and confined to the vicinity of towns; but what it is has not, apprently, been determined.

A subsequent examination of this disease by Dr. Thayer, of the Treasury Cattle Commission, showed it to be less formidable than was at first supposed. His description is as follows: The animal is dull, the coat staring, loss of appetite, secretion of milk diminished, the temperature rises, the pulse is rapid, compressible, not wiry. In five or six days diarrhœa sets in, with black stools—in a few cases, extreme constipation—and in two or three weeks death. A post-mortem examination showed the following:

The thoracic viscera were healthy, with the exception of a slight pleuritic adhesion, the result of a former pleurisy. The brain was normal, and the pleura was quite pale.

On opening the abdomen, a large quantity of serum, estimated at more than five gallons, escaped; the same pale appearance of the serous-membrane was found as was seen in the pleura; the organs were removed separately. The spleen was firm, and weighed one pound eight ounces; the liver was of average size, and firm; the gall-bladder was enlarged and distended with bile. A portion of the latter was dark. (The butcher stated that he had seen the gall-bladder twice as large, and filled with something as black as tar and as thick as molasses.) The whole digestive tract was laid open and examined, but no trace of disease could be found. The kidneys and bladder were healthy.

Regarding contagion, Dr. Thayer says: The question of contagion may be considered as an open one; the fact, as stated to me, that cattle mingle together in pastures during autumn months, and are exposed during the winter in barns, without any outbreak of the disease from August to late in June, would seem to point to other causes than contagion.

THE HORSE FEVER.—The following interesting case was sent by Dr. H. G. Farnsworth, of Clinton, Iowa, to the *Medical and Surgical Reporter:*

In this locality a new epizoötic is prevailing. It has gone through all the large stables, and is attacking isolated horses, and has also extended widely among the farmers of the county. It has produced considerable mortality. The doctor's horse, in a country practice, is his constant companion, and becomes almost as dear to him as one of his family; therefore, when my equine became sick I watched him with the same solicitude that I did any other patient.

On the morning of August 14th I found one of his hind feet swollen and quite tender; attributed it to a scratch received several days before, and let him remain in the stable. In the afternoon his eyes were dull and filled with a muco purulent discharge; this also appeared in his nostrils. The next morning the discharge was profuse; both hind legs were swollen; refused his food, and seemed to swallow water with an effort; it did not seem on account of swollen glands as much as from a difficulty of deglutition and stiffness of the jaws; gave him a small apple, which he dropped, because he could not get it between his grinders. Using my fever thermometer, I found his temperature 105°; led him into the lawn in front of the house where there was some tender grass; he seemed to put his head to the ground with difficulty, and after trying it a few times desisted, and walked to me for sympathy, lifting his hind feet with difficulty and looking dejected. His bowels were loose and his water free. Having a bottle of fl. ext. of verat. virid. in my pocket, it occurred to me to try it, which I did, for the fever. I poured two drachms into some water, which he drank in a little time, with frequent sips; it cooled the fever sensibly. The next morning the fever was as high as the day before; gave the verat. vir. in the same dose, several times during the day: he took no food, but quite a quantity of water; he had evidently stood up all night, and, in fact, did so for several days and nights afterwards; the discharge from the eyes and nose became copious.

The fever was less the third morning; thermometer marking 100°; the stiffness seemed passing away, and he tasted grass and took a few oats. He did not eat very freely before the fifth or sixth day, or lie down. The discharge then ceased, the swelling disappeared, and he walked with no difficulty. He had lost flesh very markedly, and for ten days after seemed to be weak and sweat profusely when exercised. It is evidently a contagious, self limited fever, its period of incubation, from five to eight days, and it runs its course in about five days, having a period of high fever for three days. In some instances there was much swelling of the parotids, but no cough; the jaws became very stiff, and deglutition so difficult that in some cases no fluid could be swallowed for three or four days. The fever sometimes seemed to produce delirium, as the horse would dash its head wildly about, and require restraint to prevent injury. In some cases death occurred from swelling about the throat, but in most cases it happened in the height of the fever, or when exercised too soon after it was over, or during convalescence. In all cases where the stereotype horse remedies were used, bleeding or purging, death or prolonged convalescence resulted. Young and old take it, but debility and disease, of course, added to its fatality. There is no exemption in any stable or collection of horses, but some that are isolated with care have escaped it. On farms it seems to be general. It has appeared in various parts of the State, and seems to be spreading widely. The mortality is very small, and the best treatment the expectant one, or a careful letting alone. In my case, I have no doubt the fever was modified by the ver. virid., which, if not curative, decreased the suffering of the animal.

A CURIOUS DEFORMITY is described by Dr. A. H. Baker in the *Veterinary Review.* The subject was a horse, buckskin in color, rising six years old, fifteen hands and three inches high. The peculiarity lies in the generative organs, having somewhat the appearance of an hermaphrodite, but the development of the parts is unusual even in such cases. The vulva of the female organ is natural in outline, but the lips are grown together, leaving an opening at the bottom large enough to allow the male organ to pass out, the lower part of the labia majora forming the sheath of the penis, although it encloses only a small portion of it, leaving the glands always exposed and protuding at the point occupied by the clitoris of the female. The glans is perfect in every respect, but small, having the urethral fossa, cul de sac and fungus-like protuberance of the male. The mammary glands are entirely wanting, but two small teats are found in their natural position. The animal has the general appearance and *finesse* of the mare, but has never shown any indications of being in heat; it has the organs as far as micturation is concerned, of the male, but no testicles are visible, and never shows any inclinations of the stallion when in the company of mares in heat, but minds his own business like a gelding. The urine is passed in a small, steady stream, as with the male, but he takes the position of the female. He is perfect in every other way, and can trot in 40 without training. The glans penis that is exposed is about the size of the same organ of a gelding.

ANIMAL PESTS IN GREENWOOD CEMETERY.—The New York *Sun*, citing the report of the trustees of Greenwood Cemetery for 1880, says: It is noted that chipmunks made their appearance in the cemetery during the last year for the first time. The injury done by them has been deemed a sufficient cause for their extermination, and 2853 of them were killed. Ground mice to the number of 375, 148 cats, 40 dogs, 133 snakes, 24 moles and 54 rats have also been killed.

A NERVOUS SYSTEM has been discovered by Dr. Chun in the *Velellidæ*, a family of Siphonophores; it consists of a quite typically differentiated plexus of branching and intercommunicating ganglion-cells.

A GOOD MOVE.—It is understood that in accordance with the urgent request of the Treasury Cattle Commission, backed up by the strongly expressed opinion of the leading cattle dealers at the Chicago Stock Yards, Gov. Cullum, of Illinois, will issue a proclamation forbidding any cattle from being brought into this State from the regions known to be infected with contagious pleuro-pneumonia, in accordance with Section 4 of the act of the last session of the General Assembly of the State.

TREATMENT FOR SCAB.—In the course of a long article on "Diseases of Domestic Animals," in a late number of the *North Pacific Rural Spirt*, we find the following remarks about treating sheep for scab: Sheep scab, after long continuance, is thought by some practical men to become constitutional. It is hardly necessary to point out that the disease is purely a local one, and only affects the system in the same way that any continual irritation would affect it. Naturally, when the parasites are very numerous and extend over a large surface, it is difficult to apply remedies in such a manner that all the mites, and also all their ova, shall be at once destroyed. The destruction of a large number affords so much relief that it is not difficult to believe that the disease is cured; meanwhile the ova which are left uninjured quickly produce another brood, and in a short time animals are as bad as ever; thus the flockmaster gets the impression that the affection has got into the system and cannot be got rid of by local remedies, the truth being that the treatment fails, simply because it is not properly followed up.

EVOLUTION AND HYBRIDISM IN ORNITHOLOGY.—In a review in *Nature*, of the British Museum Catalogue of Birds, vol. fifth, containing the family *Turdidæ*, by Henry Seebohm, it is stated that one great feature of the work is the courage which the author has shown in applying the doctrine of the evolution of species to the birds as they exist at the present day. The great risk that the reviewer sees in Mr. Seebohm's method lies in the fact that it affords too easy a solution for otherwise difficult problems, but we must remember that the author was himself witness to the inter-breeding of the carrion crow and the hooded crow in Siberia, and it is known that this also takes place in certain parts of Great Britain. Having seen this with his own eyes, and brought back to England a large series of the hybrids, it was only reasonable for him to suppose that other birds are also capable of hybridizing, and the reviewer thinks that the author proves his case with regard to the two blue rock thrushes (*Monticola cyanus* and *M. solitarius*), which in certain parts of China interbreed; and it is most curious that the vast majority of the birds found in the winter quarters of the Eastern blue rock thrush, from Burmah and Malaisia to the Mollucca islands, appear to be hybrids. According to the author, *Cettia cantans* and *C. minuta* also interbreed and produce an intermediate form which he calls *Cettia cantans minuta*, a reintroduction of trinomial nomenclature which the reviewer does not at all like. The intermediate form, too, appears to be principally found in the Island of Formosa, though also met with at Chefoo, on the mainland opposite Japan, while one of the other forms is an inhabitant of Japan, with the exception of one Formosan skin in the author's collection, and the other is said to breed in South China and Hainan. Of these three forms, then, we should suppose that the Formosan was the oldest bird from which the other two had developed themselves, but that they had not as yet become entirely separated as distinct species. We must wait for more evidence with regard to the South African chats, to some of which Mr. Seebohm has applied his principle of hybridization, as the reviewer is not yet satisfied that the changes of plumage cannot be accounted for by the more natural process due to age or the season of the year.

"FIRING HORSES."—Why is firing horses' legs so persistently continued? Is it, like bleeding formerly was, from habit, from popularity, or does it possess the curative power ascribed to it? Two hundred years ago, firing was said to cause diseased bone and humors to die or crumble away; now it is said to produce a permanent bandage, a theory about as tenable as the former. The operation itself consists in burning the skin with a red-hot iron, often on a considerable surface of two legs at the same operation, and no one, whether professional or otherwise, can question for a moment that it is a prolonged, most painful, and cruel operation—nay, I may say barbarous; and should only be undertaken as a necessity, or with a reasonable certanity of success, and not as, is too often the case, as a last resource, or a kill-or-cure remedy. It is also often performed where no disease exists, but professedly as a preventive, by others for every form of disease or weakness. By some so lightly as to penetrate the outer surface of skin only; by others through the entire skin, which in so far as pain is produced, matters little, since the most sensitive part is between the outer and inner, or true skin.

Is firing successful? Methinks that if the mutilated horses found working the plough, the cab, and the costermonger's cart were placed beside those still retained for the carriage, the road, and the field, and if from the latter we withdrew those which had no organic disease, or only such of a simple or temporary character, it would not be flattering to the wisdom of the present day, and might well go where bleeding has gone, as a memorial of the prejudice of the age.

What is the action of firing? It is said to first produce much superficial inflammation; secondly, a permanent bandage. To produce a greater inflammation to overcome a lesser, is a doctrine happily dying out, and if necessary, firing is a severe way of applying it. The chief claim, however, to firing is the permanent bandage theory, or the production of a thickened, inelastic, malformed skin, exceedingly sensitive to the action of strain, cold, or injury, which depends in extent as to how much of the dermis or true skin is destroyed. If the outer or only the surface of the inner skin be cauterised, it may entirely recover, and there consequently would be no permanent bandage, and if through at intervals, or done with a thin iron, the cicatrix would be so small as to affect only in line of fire; but if the firing be broad and deep the whole structure of the skin acted on would be permanently altered in character, preventing all elasticity in line and diminishing it transversely, which, if covering a joint, produces a rigidity of its action or a more or less anchylosed condition of the parts, and what permanent effect it may have is probably more due to this than any other cause.

During an active practice of twenty years, for the last ten I have not fired a single horse, although here in Bristol and neighborhood, being hilly, horses of all classes are severely worked. I have found mild and almost painless treatment more speedy, more effective, and more permanent.

In my opinion firing is unscientific. It is a cruelly painful and prolonged operation. Its results are very uncertain, and do not justify the operation. It considerably blemishes, and consequently depreciates the money value of as well as the owner's respect for his horse; and finally, firing seldom removes, often does not diminish, and sometimes increases the disease under treatment.—G. W. Gregory, M.R.C.V.S.

Tapeworm.—The origin of these parasites in a large number of lambs is often a mystery. As the *cysticerci* of the tapeworm found in the lambs are not, like measles, found in the muscles of vertebrated animals, it is considered (by Cobbold) to be almost certain that some of the small molluscs and insects found in water, or in damp situations, constitute the intermediary bearers of the tapeworm larvæ in question. The tapeworm inhabiting the lambs is the *Tænia expansa*. The lambs thus affected may have been inhabited by tapeworm some length of time before any symptoms of ailment are noticed; for it is a slowly-progressing disease. Amongst the remedial measures may be recommended the removal of the whole flock to a different pasture, where the ground is high and dry, and where provision should be made for ample and comfortable shelter. The weakly animals should be supported by oatmeal gruel or wheaten-flour gruel. Lambs suffering from scours should have a dose of one or two ounces of linseed oil, with two or three drops of croton oil, mixed, and given in a gill of warm gruel. Three hours subsequently, give one tablespoonful of the following cordial mixture: Prepared chalk, two ounces; catechu, one ounce; ginger, half an ounce; opium, one drachm: peppermint water, one pint. Various remedies are resorted to for the expulsion of tapeworms. Only a few are known to be reliable or effective. Among these are, kamala, kousso, koussin, oil of male fern, oil of turpentine, picate of potassium, etc. Two drachms of the kousso, in a gill of linseed tea or gruel, may be given every other day, for a few times. The koussin is still better, and may be given in two-grain doses, in a gill of wormwood decoction, twice or thrice, with two or three days between the doses. One dose of ten to twenty grains of the picrate of potassium may be given in half a pint of linseed tea, and should be followed, five hours thereafter, with a dose of physic, such as an ounce of castor oil, a scruple each of powdered ginger and salt of tartar, and an ounce of treacle. Oil of turpentine may be given in drachm doses, in a gill of linseed tea or gruel, once a day for a few days. Powdered squill has been recommended, in five to ten grain doses, with a teaspoonful of powdered ipecacuanha, given in gruel, twice or thrice daily. To expect success from any remedy, the animals should be subjected to treatment before the disease has so far advanced that a cachectic state or general emaciation exists. To ensure expulsion of the tapeworms after the administration of kousso, koussin or the picrate of potassium, the animals should not be fed the evening preceding the administration of the medicine early in the morning; and during the day of treatment, they should be given only a little hay, or, better, water into which is stirred some wheat flour. The tapeworms, as well as the fæces, passed by the lambs, after the medicine has been given, should be carefully gathered, and placed in some vessel, for the purpose of complete destruction by fire. The lambs should be liberally fed and comfortably housed. Change of situation, change of field, change of food are essential requisites in such a state of affairs as the one under consideration.—Paerin, in *National Live Stock Journal.*

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